

# 2020 Census Detailed Operational Plan for: 21. Data Products and Dissemination Operation (DPD)

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*A New Design for the 21st Century*

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Prepared by: Decennial Census Management Division



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# Approvals

This DPD Detailed Operational Plan has been reviewed and approved for use.

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## 1. Document Purpose

The 2020 Census Detailed Operational Plan for the Data Products and Dissemination operation (DPD) is intended for use by U.S. Census Bureau managers, staff, contractors, and other internal and external stakeholders working on the 2020 Census. The document presents the detailed operational design for the 2020 Census DPD operation and includes a summary of the operational processes involved, their inputs, outputs, controls, and the basic mechanisms employed to conduct the operational work.

Anticipated uses of this document include the following:

- Communication – Documents operational design details for internal and external stakeholders.
- Planning – Documents planning assumptions and key milestones.
- Staffing – Documents staffing needs and strategies.
- Design – Describes operations and flows, which inform design of Information Technology (IT) systems, manual processes, and training.
- Development – Identifies business rules and required capabilities to be developed.
- Testing – Provides a basis for developing integrated test plans for IT systems and processes.

This document complements the 2020 Census Operational Plan, which presents the 2020 Census operational design and covers all operations required to execute the 2020 Census, starting with precensus address and geographic feature updates and ending once census data products are disseminated and coverage and quality are measured.

## 2. Operational Overview

### 2.1 Operation Purpose

The Data Products and Dissemination (DPD) operation performs three primary functions:

- Prepare and deliver the 2020 Census apportionment data for the President of the United States to provide to Congress by December 31, 2020.
- Tabulate and disseminate 2020 Census data products for use by the states to delineate congressional and state and local legislative redistricting as required by Public Law 94-171.
- Tabulate and disseminate 2020 Census data for use by the public.

### 2.2 Background

The DPD operation is responsible for the production of many data products, including national and state summary files, tabulated informational files, and data comparison tables. This includes electronic and printed products that cover population and housing unit tabulations, geographical maps, and products specific to the Island Areas. DPD is conducting a thorough review of the past product design (cross-tabulations and iterations of characteristics), while also looking to ensure that users can find data quickly and easily after the 2020 Census. The Census Bureau will undertake a thorough analysis of the proposed 2020 Census data products in keeping with our sworn obligation to protect respondents' data as data stewards under Title 13. The variety of tabulations and geographic summary levels included in previous census data releases must be balanced with Census Bureau recognition that extensive work in algorithm design allows for making strong inferences about individuals from large sets of tabulations, and for doing so by combining official tabulations with external knowledge and data sources.

The Census Bureau has continually added better and stronger protections to keep the data it publishes anonymous and underlying records confidential. Historical methods cannot completely defend against the threats posed by today's technology. The Census Bureau is doing this by moving to a new, advanced, and far more powerful confidentiality protection system, which uses a rigorous mathematical process that protects respondents' information and identity in all of its publications. The new tool is based on the concept known in scientific and academic circles as "differential privacy." It is also called "formal privacy" because it provides provable mathematical guarantees about the confidentiality protections that can be independently verified without compromising the underlying protections.

For the 2010 Census and Census 2000, both tabulation and dissemination processes were accomplished under contract with IBM and through the American FactFinder website. Based on lessons learned from the 2010 Census, recommendations of the Data Transformation Taskforce refocused the Census Bureau to provide an approach to restructure and enhance data

dissemination activities across the entire agency. The Center for Enterprise Dissemination Services and Consumer Innovation (CEDSCI) initiative began planning and development for enterprise requirements. The 2020 Census is engaged with these opportunities to innovate as follows:

- Use of enterprise solutions for preparing 2020 Census data products and disseminating the information to the public.
- Enhancements to existing tabulation systems to support 2020 Census tabulation as an enterprise solution.

## **2.3 Design Overview**

The sections below present the high-level design for the Data Products and Dissemination operation (DPD). Please refer to the 2020 Census Operational Plan for a complete inventory of design decisions for all 2020 Census operations.

### **2.3.1 High-Level Operational Design**

The design of the DPD operation for the 2020 Census includes seven major operational activity areas:

- Conduct DPD Planning.
- Create Apportionment Data Products.
- Perform Disclosure Avoidance.
- Create State Redistricting Data Products.
- Create Other Data Products.
- Create Island Areas Censuses Data Products.
- Provide Files to Archiving Operation.

Each of these major activity areas is summarized below. Together, these activities represent the complete set of work that needs to be performed to conduct this operation.

The full hierarchy of activities for the DPD operation is provided in Appendix C in the form of an Activity Tree. In the Activity Tree, each major operational activity area listed above is numbered and then decomposed into a numbered set of subactivities, some of which are further decomposed into more detailed numbered subactivities or steps.

For a full description of the operational subactivities that comprise the DPD operation, see the Detailed Process Description discussions in Section 3 below.

### ***Conduct DPD Planning***

The DPD operation participates in the planning and development of the CEDSCI platform for data dissemination and the assessment of data visualization tools designed to enhance user experience. Data products and dissemination planning begins with the development of the internal product plan that details how the products are defined, including content, structure, and geographic level. The DPD will analyze and evaluate data user feedback and usage metrics from the data releases following the 2010 Census to inform 2020 Census data product decisions. A thorough examination of data user needs is also required, based on the recognition that skill sets are accelerating in data access tools. There is also a proliferation of a broad array of external datasets and domains, which presents us with new challenges to product design and dissemination since data linkage with enhanced computer capabilities has emerged since the Census 2000 and 2010 Census product plans were developed and deployed.

The Census Bureau conducted its solicitation of feedback from data users in the notice entitled “Soliciting Feedback from Users on 2020 Census Data Products,” which was published in the *Federal Register* on July 19, 2018 [83 FRN 34111]. The comment period on that notice closed on September 17, 2018, and was reopened to provide more time for outreach to data users and stakeholders and for responses to be gathered.

### ***Create Apportionment Data Products***

The DPD produces documents required by public law to satisfy apportionment and redistricting requirements. Title 13, U.S. Code (U.S.C.) requires that the apportionment population counts be delivered to the Office of the President within 9 months of the census date. Apportionment counts are based on the Census Unedited File, the Federally Affiliated Overseas Personnel and Dependents Count File, and a geographic file from the Geographic Programs Operation (GEOP) named the MAF Identifier State Change (MISC) file. For the 2020 Census, the census date is April 1, 2020. This means that the President will receive the counts by December 31, 2020. The DPD IPT is responsible and the Population Division is accountable for the preparation and execution of apportionment and the apportionment deliverables.

### ***Perform Disclosure Avoidance***

To help prevent anyone from tracing statistics back to a specific respondent, the Census Bureau alters the underlying statistical tabulations before publication. This process is called “noise injection.” It has been a key feature of Census Bureau confidentiality protection systems for decades. Enough noise must be added to protect confidentiality, but too much noise could damage the statistics’ fitness-for-use. “Differential privacy” is based on the cryptographic principle that an attacker should not be able to learn any more about an individual from the statistics the Census Bureau publishes using an individual’s data than from statistics that did not

use an individual's data. After tabulating the data, the Census Bureau applies carefully constructed algorithms to modify the statistics in a way that protects individuals while continuing to yield accurate results. The Census Bureau assumes that everyone's data are vulnerable and provide the same strong, state-of-the-art protection to every record in its database.

Because of privacy protection, users should not assume that tables with cells having a value of one or two reveal information about specific individuals. In previous decennial censuses beginning in the 1990 Census through the 2010 Census, data swapping procedures were used. More information on Data Protection and Differential Privacy is found in [www.census.gov](http://www.census.gov) under <https://www.census.gov/privacy>. More information on the Census Bureau's application of the methods can be found in the working papers and supporting Privacy information on [https://www.census.gov/about/policies/privacy/statistical\\_safeguards.html](https://www.census.gov/about/policies/privacy/statistical_safeguards.html)

### ***Create State Redistricting Data Products***

The legislatures in each state are responsible for geographically defining the boundaries of their congressional and other election districts—a process known as “redistricting”—and more detailed census results are used for these purposes.

Redistricting information is generated by the DPD to meet this need and is provided to each state's governor and legislative leaders with pertinent census population totals and other congressional, state, and local redistricting data, in order to fulfill the requirements of Public Law 94-171.) Redistricting information must be provided by the Census Bureau by April 1, 2021. This redistricting information is accompanied by census maps, which are provided by the Redistricting Data Program operation (RDP).

### ***Create Other Data Products***

Data products planning for the 2020 Census include the review and assessment of the legacy decennial datasets such as: demographic profiles, Summary File 1 showing population and housing unit characteristics, Summary File 2 showing population and occupied housing unit characteristics iterated by race/Hispanic origin/American Indian and Alaska Native tribe categories, summary files for congressional districts and state legislative districts reflecting the most recent boundary changes submitted to the Census Bureau, and an American Indian and Alaska Native summary file.

### ***Create Island Areas Censuses Data Products***

Data products planned for the Island Areas (Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands) include demographic profiles, summary files, printed reports, and detailed cross tabulations.

### ***Provide Files to Archiving Operation***

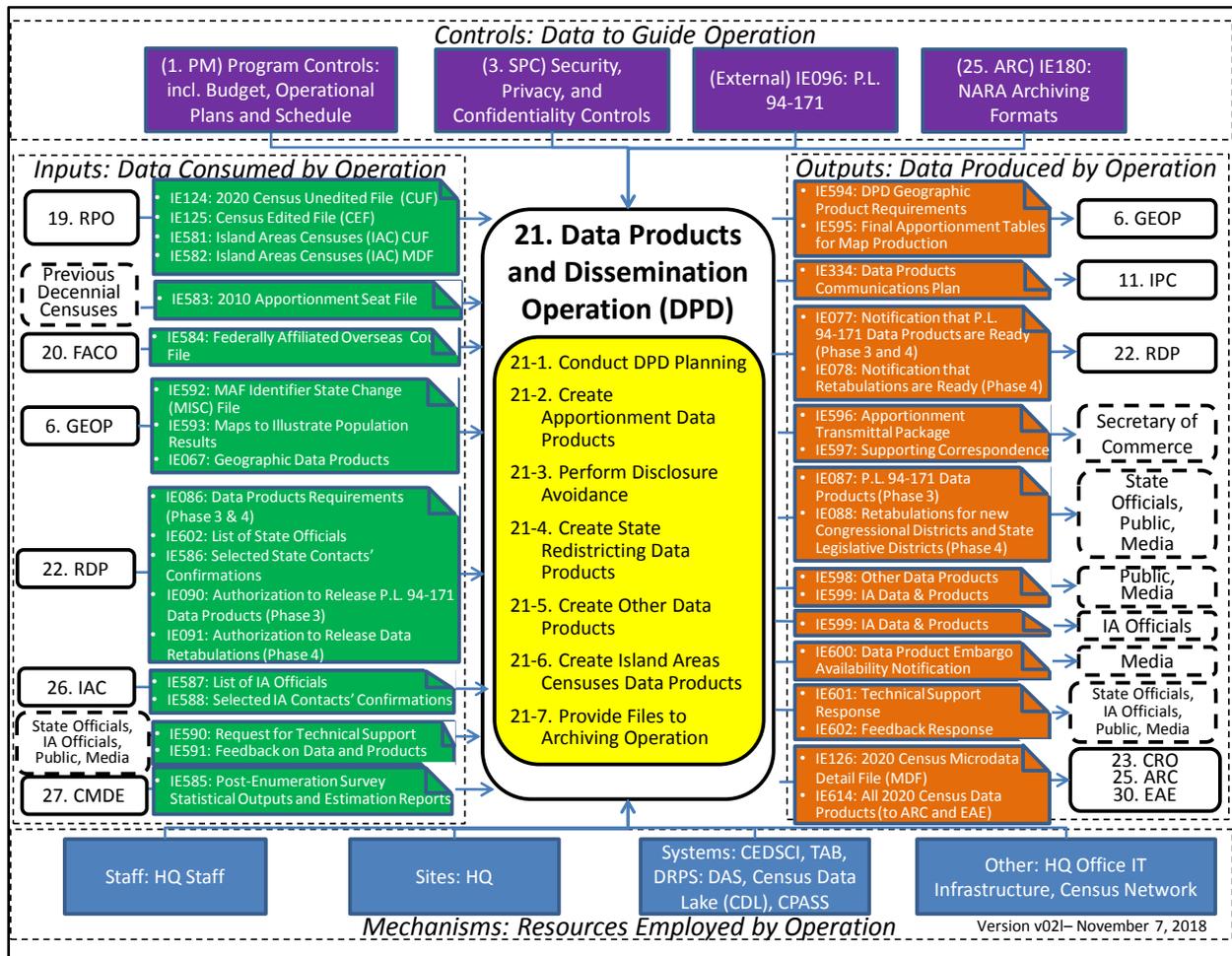
The Archiving operation (ARC) manages 2020 Census records management. The tangible datasets produced by DPD are provided to the National Archives and Records Administration (NARA). The Census Bureau has not yet determined if the 2020 Records Schedule agreement with NARA will include dynamic data products, such as visualization or application programming interfaces from 2020 Census dissemination.

### **2.3.2 DPD Operational Context**

The DPD operational activities described above are conducted within the context of other 2020 Census operations and other programs or data sources that are external to the 2020 Census Program. One way to depict an operational context is by using a “Context Diagram,” which shows the boundary of the operational process, the operational activities it contains, and the information exchanged with its neighbor operations (or other entities) as well as the resources (mechanisms) needed to conduct the operational work.

Figure 1 is a top-level context diagram for the DPD operation represented as an Integrated Definition, Level 0 (IDEF0) model. An IDEF0 model of a process (or operation) shows the Inputs, Controls, Outputs, and Mechanisms of the process. These IDEF0 model elements are summarized below and described further in the sections that follow.

The yellow box in the center of the IDEF0 model lists the major operational activity areas for the operation, numbered as given in the DPD operation Activity Tree in Appendix C. Specific Information Exchanges (IE) are shown in different colored boxes to represent the Inputs (green boxes on left side), Outputs (orange boxes on right side), Controls (purple boxes on top), and Mechanisms (blue boxes on the bottom). Boxes to the left of the Inputs indicate the *Provider* of the inputs to the operation (typically another 2020 Census operation or an external source). The Provider of the Controls is noted in the box itself. Boxes to the right of the Outputs indicate the *Receiver* of the outputs (typically another 2020 Census operation or external entity). Each Information Exchange has a name and a unique number for identification purposes.



**Figure 1: Data Products and Dissemination Operation (DPD) Context Diagram**

For Data Products and Dissemination, there is a variety of input files for Apportionment and Tabulation/Dissemination. These include inputs representing the response data in a variety of stages from post-processing such as the Census Unedited File (CUF), the Census Edited File (CEF), and Microdata Detail File (MDF) response data files. Inputs to the Apportionment processing and the Tabulation System are evaluated and approved before production processing commences. The Count Review Operation (CRO) provides the framework and processes for the review and approval of the CUF, CEF, and MDF.

Data Products and Dissemination Processing Controls include basic program controls such as budget and schedule, as well as Title 13 of the U.S.C., which mandates data security, confidentiality, and stewardship practices. Also, a 1975 law requires the Census Bureau to provide state governments with selected decennial census data tabulations and related geographic products for specific geographic entities by April 1 of the year following the census. These data

and products are used by the states to redefine their congressional districts and the areas used for state and local elections—a process called redistricting. Additionally, Title 2 of the U.S.C., which states that the President shall transmit to Congress a statement showing the number of people in each state, as ascertained under the 17<sup>th</sup> and each subsequent decennial census of the population, and the number of representatives to which each state would be entitled under an apportionment of the then existing number of representatives by the method known as the method of equal proportions, no state to receive less than one member.

Output for Data Products and Dissemination include results from apportionment and tabulation for the President, Congress, the states, the Island Areas, and data users. This includes metadata for use in the dissemination application on census.gov (“search” and service calls to the CEDSCI platform). The outputs undergo a rigorous evaluation process to guarantee thresholds for quality and interface standards are met. Finally, Data Products and Dissemination Mechanisms include the staff at headquarters who use HQ office IT infrastructure and the Census Data Lake (CDL).

For detailed descriptions of the Inputs, Controls, Outputs, and Mechanisms used by the DPD operation, see the sections that follow.

### 2.3.2.1 DPD Operational Inputs

Inputs are the data that are consumed by the operation. [Table 1](#) lists the inputs to the DPD operation.

**Table 1: DPD Operational Inputs**

Provider	Information Exchange	Description
19. Response Processing Operation (RPO)	IE124: 2020 Census Unedited File (CUF)	All person and household records for the 50 states, D.C., and Puerto Rico, including GQ records with person records for the 2020 Census. The CUF is the baseline file for the total count of people and the total count of housing units. The final frame for GQ records is also included.

<b>Provider</b>	<b>Information Exchange</b>	<b>Description</b>
19. Response Processing Operation (RPO)	IE125: Census Edited File (CEF)	All person and household records for the 50 States, D.C., and Puerto Rico, including GQ records with person records for the 2020 Census. The CEF is the results file for the consistency edits, imputation, and allocation of characteristics for all people (in housing units and GQs) and housing unit characteristics.
	IE581: Island Areas Censuses (IAC) CUF	All person and household records for the 4 Island Areas, including GQ records with person records for the 2020 Census. The CUF is the baseline file for the total count of people and the total count of housings units. The final frame for GQ records is also included.
	IE582: Island Areas Censuses (IAC) MDF	The input files for tabulation (four Island Areas), which have been processed through consistency edits and disclosure avoidance modeling to protect privacy and confidentiality.
Previous Decennial Censuses	IE583: 2010 Apportionment Seat File	The results of the 2010 Census Apportionment process, which are used to calculate the change in the number of House seats each state will incur as a result of the 2020 Census Apportionment process. The change in number of seats is included in the 2020 Census Apportionment transmittal package.
20. Federally Affiliated Count Overseas operation (FACO)	IE584: Federally Affiliated Overseas Counts File	The set of records from FACO that include counts for all federally affiliated people living overseas (i.e., U.S. military and federal civilian employees stationed or assigned overseas and their dependents living with them), as submitted by their sponsor federal agency. FACO data include total counts by state combined across DoD and all federal civilian departments and agencies.

<b>Provider</b>	<b>Information Exchange</b>	<b>Description</b>
6. Geographic Programs operation (GEOP)	IE592: MAF Identifier State Change (MISC) File	A file that provides the Master Address File Identifiers (MAFIDs) of any living quarters that must be tabulated in a different state because of changes between collection and tabulation geographic boundaries. This file provides anomalies to the staff calculating apportionment.
	IE593: Maps to Illustrate Population Results	Maps derived from the final apportionment tables to illustrate the population results. These maps are provided by GEOP to DPD for inclusion in the apportionment results deliveries.
	IE067: Geographic Data Products	The Geographic Products that will be needed to conduct the specific 2020 Census Operations work. For DPD, this includes: <ul style="list-style-type: none"> <li>• Geographic Reference File - Codes (GRF-C)</li> <li>• Geographic Reference File - Names (GRF-N)</li> <li>• Data Product Preparation File (DPP)</li> </ul>
22. Redistricting Data Program operation (RDP)	IE086: Data Products Requirements (Phase 3 &4)	Requirements for the P.L. 94-171 data products created in Phase 3 and the re-tabulations created in Phase 4.
	IE602: List of State Officials	List of state officials (including their email addresses) who need to be registered so that they will receive the redistricting data products.
	IE586: Selected State Contacts' Confirmations	Confirmations of the receipt of the redistricting data within the state list of recipients.

<b>Provider</b>	<b>Information Exchange</b>	<b>Description</b>
22. Redistricting Data Program operation (RDP)	IE090: Authorization to Release P.L. 94-171 Data Products (Phase 3)	The release through the CEDSCI database platform proceeds after the RDP and DPD authorize at each stage.
	IE091: Authorization to Release Data Retabulations (Phase 4)	RDP provides DPD with the specific timing and trigger authorization for subsequent tabulations based on new districts in Phase 4.
26. Island Areas Censuses operation (IAC)	IE587: List of IA Officials	List of Island Areas officials (including their email addresses) who need to be registered so that they will receive their data products.
	IE588: Selected IA Contacts' Confirmations	Confirmations of the receipt of the housing unit counts data within the Island Area list of recipients.
State Officials, IA Officials, Public, Media	IE590: Request for Technical Support	Requests for support from users of the data products produced for the 2020 Census or the Island Areas Censuses.
	IE591: Feedback on Data and Products	Feedback from users about the data products produced for the 2020 Census or the Island Areas Censuses.
27. Coverage Measurement Design and Estimation operation (CMDE)	IE585: Post-Enumeration Survey Statistical Outputs and Estimation Reports	Reports and statistical outputs from Post-Enumeration Survey (PES) activities. Statistical outputs include estimation microdata and replicate weights.

### 2.3.2.2 DPD Operational Controls

Controls are the data that guide the behavior of the operation. They are not consumed by the operation, but rather they provide guidance, models, limits, criteria, cutoff dates, or other information that controls the way in which the operational work is performed.

Table 2 lists the controls for the DPD operation.

**Table 2: DPD Operational Controls**

Provider	Information Exchange	Description
1. Program Management operation (PM)	Program Controls	Program Control information including: <ul style="list-style-type: none"> <li>• Budget</li> <li>• Operational Plans and Schedule</li> </ul>
3. Security, Privacy, and Confidentiality operation (SPC)	Security, Privacy, and Confidentiality Controls	Laws, policies, regulations, and guidelines related to physical security, IT security, data security and privacy and confidentiality impacts, analyses, and processes. These include but are not limited to Title 13, Title 26, and other laws and policies related to protection of personally identifiable information.
External	IE096: P.L. 94-171	The law that requires the Census Bureau to provide state legislatures and/or redistricting commissions with the small area census population tabulations necessary for legislative redistricting. The law also specifies: <ul style="list-style-type: none"> <li>• The states choosing to participate in this voluntary program will identify the small areas for which they desire specific data tabulations and submit these areas following timelines established by the Secretary of Commerce. (The small areas historically identified by the states are census tabulation blocks and voting districts.)</li> <li>• The Census Bureau must transmit the population tabulations for these areas to the states within one year of Census Day, customarily April 1 of the year following the census.</li> </ul> For more information, refer to: <a href="http://www.census.gov/rdo/about_the_program/">http://www.census.gov/rdo/about_the_program/</a>

Provider	Information Exchange	Description
25. Archiving operation (ARC)	IE180: NARA Archiving Formats	Acceptable archiving formats to assist in determining how to prepare response records for archiving based on NARA and Census Bureau requirements.

### 2.3.2.3 DPD Operational Outputs

Outputs are the data produced by the operation. The outputs constitute the results of operational work that has been performed. Outputs produced may be used as inputs or controls to other operations.

Table 3 lists the outputs from the DPD operation.

**Table 3: DPD Operational Outputs**

Consumer	Information Exchange	Description
6. Geographic Programs operation (GEOP)	IE594: Geographic Product Requirements (for DPD)	Requirements for the Geographic Products that will be needed to conduct the specific 2020 Census DPD operation work.  For DPD, this includes: <ul style="list-style-type: none"> <li>• Geographic Reference File - Codes (GRF-C)</li> <li>• Geographic Reference File - Names (GRF-N)</li> <li>• Data Product Preparation File (DPP)</li> </ul>
	IE595: Final Apportionment Tables for Map Production	The final Apportionment Tables provided by DPD to GEOP to be used for apportionment-related map production. Geographic program produces maps derived from the final apportionment tables to illustrate the population results. These maps are provided back to DPD for inclusion in the apportionment results deliveries.

Consumer	Information Exchange	Description
11. Integrated Partnership and Communications operation (IPC)	IE334: Data Products Communications Plan	The requirements for communications related to the dissemination of data products resulting from the 2020 Census.
22. Redistricting Data Program operation (RDP)	IE077: Notification that P.L. 94-171 Data Products are Ready (Phase 3)	Notification received when the data products are ready to be released. The data products (2020 Census population and housing counts by tabulation block, voting district and other geographies) are prepared for the states in accordance with P.L. 94-171, so states can conduct their redistricting.
22. Redistricting Data Program operation (RDP)	IE078: Notification that Retabulations are Ready (Phase 4)	Notification received when the re-tabulations are ready to be released. These are re-tabulations of 2020 Census data for CDs and SLDs as the boundaries are updated for subsequent legislative sessions in the years after 2021.
Secretary of Commerce	IE596: Apportionment Transmittal Package	The apportionment and resident population tables (resulting from the 2020 Census), which are sent to the Secretary of Commerce.
	IE597: Supporting Correspondence	Any requested supporting materials, which may include the correspondence to the President or correspondence and supporting materials to the House of Representatives [at the future discretion of the Director and Secretary.]
State Officials, Media, Public	IE087: P.L. 94-171 Data Products (Phase 3)	Data products (2020 Census population and housing counts by tabulation block, VTD, and other geographies) that are prepared for the states in accordance with P.L. 94-171, so states can conduct their redistricting.
	IE088: Re-tabulations for new Congressional Districts and State Legislative Districts (Phase 4)	Retabulations of the 2020 Census data provided to the states and based on their new updated redistricting plans.

<b>Consumer</b>	<b>Information Exchange</b>	<b>Description</b>
Public, Media	IE598: Other Data Products	Data users are individuals, organizations, academia, and the media.
	IE599: IAC Data & Products	Data users are individuals, organizations, academia, and the media.
IA Officials	IE599: IAC Data & Products	Highest elected officials in the Island Areas; local government and community leaders.
Media	IE600: Data Product Embargo Availability Notification	Embargo access for the media that data products are available for media review and will be released to the public in 24 hours.
State Officials, IA Officials, Public, Media	IE601: Technical Support Response	Response to requests for support on the data products produced for the 2020 Census or the Island Areas Censuses.
	IE602: Feedback Response	Response to feedback received about the data products produced for the 2020 Census or the Island Areas Censuses.
23. Count Review Operation (CRO) 25. Archiving operation (ARC) 30. Evaluations and Experiments operation (EAE)	IE126: 2020 Census Microdata Detail File (MDF)	The input files for tabulation (50 states, D.C., and Puerto Rico), which have been processed through consistency edits and disclosure avoidance modeling to protect privacy and confidentiality.
	IE614: All 2020 Census Data Products (to ARC and EAE)	All reports, summary files, and all other “static” data products are permanent records transferred to NARA.

### 2.3.2.4 DPD Operational Mechanisms

Mechanisms are the resources (people, places, and things) that are used to perform the operational processes. They include staff resources, infrastructure sites, and systems, and other technology infrastructure.

#### *Staff Resources*

Table 4 identifies the staff resources employed for the DPD operation.

**Table 4: Staff Resources used within DPD Operational Activities**

<b>Staff Resources</b>	<b>Description/Role</b>
HQ Staff	HQ staff who manage and deploy the DPD operational activities.

#### *Infrastructure Sites*

Table 5 identifies the Infrastructure Sites employed for the DPD operation.

**Table 5: Infrastructure Sites for DPD Operational Activities**

<b>Infrastructure Site</b>	<b>Description/Role</b>
Census Headquarters (HQ)	HQ site for office work conducted in support of the DPD operation.

#### *Systems and other Technology Infrastructure*

Table 6 identifies the systems employed for the DPD operation.

**Table 6: Systems used within DPD Operational Activities**

System	Description
Center for Enterprise Dissemination Services and Consumer Innovation (CEDSCI)	CEDSCI is led by the Research and Methodology Directorate, its diverse membership is also composed of technologists, scientists, and analysts from Decennial, Economic, Demographic, Communications, and other offices. Their challenge is to modernize our technology platforms and leverage existing innovations to provide a set of shared dissemination services that enable both Census Bureau staff and our data consumers to do more with the massive content published year-round.
Decennial Tabulation System (TAB)	Tabulation system that is generalized and enhanced to support both the ACS and the 2020 Census tabulations of response data during 2020 Census production.
Decennial Response Processing System (DRPS): Disclosure Avoidance System (DAS)	DAS is a subsystem of the Response Processing System, and it applies privacy controls to microdata as the data are transformed in a flow from the CEF to the MDF. The privacy controls assure that there is no direct mapping between individual records in the CEF to individual records in the MDF.
Census Data Lake (CDL)	The CDL serves as the repository for paradata and response data. It is built on a distributed, scalable platform to support data ingest, storage, provide data access to reporting and analytics applications.
Census Public Access Security System (CPASS)	CPASS provides the embargo module in the Identity and Access management solution that is used to allow embargo access to data sets. CPASS is part of the current Census Bureau Telecommunications Office enterprise functionality.

Other technology infrastructure employed for the DPD operation includes:

- Office IT infrastructure at headquarters for conducting DPD operational work. This infrastructure is provided by the IT Infrastructure (ITIN) operation.
- Census Network connectivity for data transmission between operational systems and operational sites. This connectivity is provided by ITIN.

## 2.4 DPD Data Flow and Operational Influences

Figure 2 is an Integrated Operations Diagram (IOD), which describes the design concepts for all 2020 Census operations associated with the development and dissemination of 2020 Census data products covering the 50 states, the District of Columbia, and Puerto Rico. The Data Products and Dissemination operation (DPD) is the primary operation involved in these activities. DPD receives data from the Response Processing Operation (RPO), the Geographic Programs operation (GEOP), and the Federally Affiliated Count Overseas operation (FACO) to create apportionment data products (counts), which are delivered to the President for use by Congress for apportioning seats in the House of Representatives. Data from RPO and GEOP are also used to create redistricting data products for use by the states for redistricting and other data products for use by the public. DPD also receives data for the Island Areas Censuses operation (IAC) from GEOP and the RPO Island Areas Response Processing function (RPO/IARP). IAC data are not applicable to the Count Question Resolution operation (CQR) activities, nor are they involved with apportionment or FACO.

All final data products as well as official response data from the 2020 Census are sent to the Archiving operation (ARC) for archival within the Census Bureau and to the National Archives and Records Administration (NARA) for permanent retention. Island Areas Censuses' materials and data products and additional information collected during data collection are also archived.

Three other operations support the dissemination of data. The Redistricting Data Program operation (RDP) coordinates the dissemination of redistricting data products to the states. The Integrated Partnership and Communications operation (IPC) provides support in communicating information about the data products. Finally, CQR provides a mechanism for governmental units to challenge the accuracy of their final 2020 Census counts.

The discussion below walks the reader through the diagram, using the circled numbers to help the reader follow the flow.

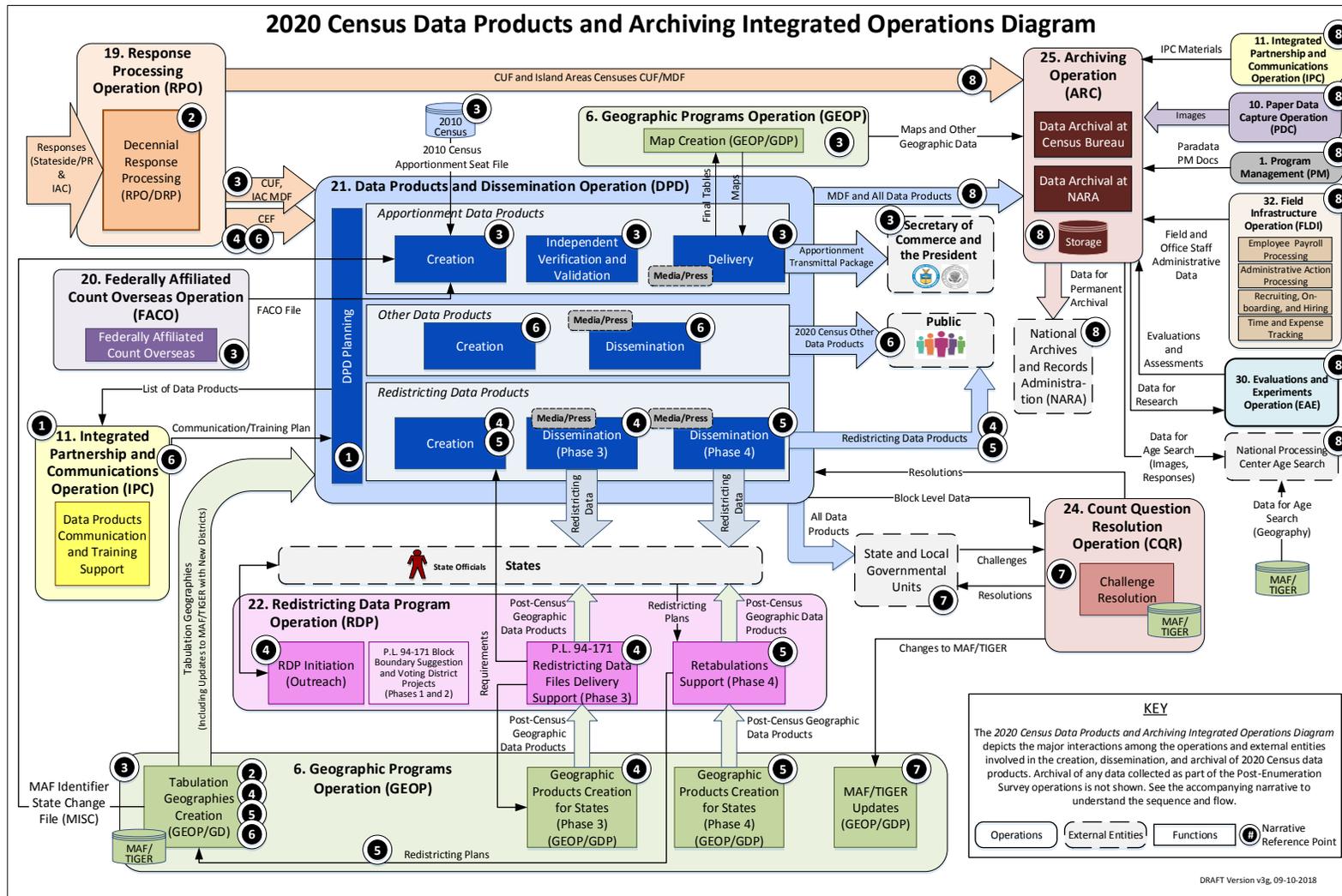


Figure 2: 2020 Census Data Products and Archiving Integrated Operations Diagram

① Before the start of the 2020 Census, DPD performs a planning function, creating specifications for the various data products and creating the list of data products and providing it to the IPC so it can create a plan for the training and communications support required to disseminate 2020 Census data products.

② Once data collection is complete, the RPO Decennial Response Data Processing (RPO/DRP) function processes the 2020 Census response data for the 50 states, the District of Columbia, and Puerto Rico (stateside/Puerto Rico data) and creates the Census Unedited File (CUF). The CUF is provided to DPD as input to the apportionment process. The CUF comprises 50 separate files (one for each state), which are used to create the apportionment data products and two additional files for the District of Columbia and Puerto Rico.

CUF is further processed by RPO to produce the Census Edited File (CEF). CEF is provided to DPD, which uses this data to create the Microdata Detail File (MDF). The MDF, which contains microdata (one record per housing unit and group quarters enumeration data), is used by DPD to create the redistricting data products and the other data products.

In addition, the response data from the IAC will be processed by RPO to produce the Island Areas Censuses CUF, Island Areas Censuses CEF, and Island Areas Censuses MDF.

The GEOP Geographic Delineations (GEOP/GD) function creates tabulation geographies and sends these to DPD so it can link the blocks and housing unit records to specific geographies to produce the data products.

### **Apportionment Data Products**

③ The primary requirement served by the decennial census is the apportionment of seats to the states for the House of Representatives. DPD creates the apportionment counts and delivers them to the President of the United States (through the Secretary of Commerce) to provide to Congress by December 31, 2020.

DPD performs three functions to create the apportionment products: creation, independent verification and validation, and delivery. To create the products, DPD receives, verifies, and tallies the final 2020 Census CUF from RPO and the Master Address File (MAF) Identifier State Change (MISC) File from GEOP to create a final resident population file, which is then combined with the count of federally affiliated people overseas, provided by FACO.

Apportionment calculation formulas are then applied, and the results are validated to create the final apportionment results. These results go through an independent verification and validation

by Census Bureau staff and are then used to create the final apportionment tables, which illustrate the apportionment population by state and the corresponding number of seats in the U.S. House of Representatives, including the change in seats per state since the 2010 Census Apportionment Seat File was calculated. DPD then creates a memo and a draft letter to the President from the Secretary of Commerce and sends these, with the final apportionment tables, to the Secretary of Commerce. The transmittal package includes three unique tables:

- Apportionment Population and Number of Representatives (for the 50 states).
- Resident Population (for the 50 states, the District of Columbia, and Puerto Rico).
- Federally Affiliated Overseas Population (for 50 states and the District of Columbia).

The final tables are also made available to the Geographic Data Processing function within GEOP (GEOP/GDP), which produces map illustrations of the population results. The data and maps are published to the Census Bureau website after a press conference with the media.

### **Redistricting Data Products**

 Public Law (P.L.) 94-171 requires the development of redistricting data products to be made available to state officials. RDP is the operation responsible for ensuring that P.L. 94-171 is carried out and serves as the Census Bureau's point of contact for the program, handling all communications and providing training and support to the states for the program.

Halfway through the decade, RDP initiates outreach to the states to invite them to participate in the program and establish a liaison. RDP then conducts the first two phases of the program: the Block Boundary Suggestion Project (Phase 1) and the Voting District Project (Phase 2). These phases are shown in light pink, as they happen before the creation of any data products.

Once the 2020 Census data collection is complete, DPD uses the CEF from RPO to create the 2020 Census MDF. The MDF and geographic data from the GEOP/GDP are used to create the redistricting data files in accordance with requirements provided by RDP. The files go through several processing and review steps before being disseminated. Various embargoes are used to ensure proper timing of the release and receipt of the data. DPD releases the redistricting data to the states, the media, and the public, coordinating the release to the states with RDP to ensure the data are received. RDP also works with GEOP to release geographic data products. GEOP creates the geographic data products in accordance with requirements provided by RDP and then sends these products to RDP, which sends them to the states. This first release of redistricting data products and geographic products is referred to as Phase 3.

⑤ Once the states use the 2020 Census data to develop their redistricting plans, Phase 4 of RDP occurs. States send their new redistricting plans (updated congressional districts and state legislative districts) to RDP, which reviews them and provides them to GEOP to update the MAF/Topologically Integrated Geographic Encoding and Reference (TIGER) system with the new districts. GEOP sends the updated congressional and state legislative district tabulation geographies to DPD, which retabulates the 2020 Census redistricting data using the new district boundaries. As with Phase 3, DPD releases the updated data to the states in coordination with RDP. GEOP updates the geographic products and provides them to RDP, which sends them to the states.

### **Other Data Products**

⑥ A key service provided by DPD is the development of specific 2020 Census data products for the public. These products go through a two-step process to create and then disseminate the products.

To create the stateside/Puerto Rico data products, DPD uses the 2020 Census MDF created earlier and geographic data from GEOP. The geographic data are used to determine how to structure and layer the data by geographic area (e.g., state, city, and tract). The MDF data are tabulated based on rules and specifications and the tabulated results are reviewed for accuracy. DPD enhances the data and creates data products by generating and applying meta tags and developing geographic and visualization products to make the data more usable. These products are reviewed by subject matter experts and approved by management before being held under public embargo.

In addition to the stateside/Puerto Rico data products described above, DPD also produces a set of data products for the Island Areas Censuses using the Island Areas Tabulation Geography data from GEOP and the Island Areas Censuses CUF (IAC-CUF) and Island Areas Censuses MDFs from RPO.

DPD informs the media of the availability of the data, and once the public embargo is released, DPD publishes the data products to the Census Bureau's website. IPC provides a plan for and supports efforts to communicate and demonstrate to data users how the 2020 Census data can be used in their communities.

DPD provides ongoing technical support on these various data products and also receives and responds to customer feedback and inquiries.

## Count Question Resolution

⑦ The states have a finite period to challenge the counts and provide supporting evidence. This is done through CQR, which works to resolve the governmental challenges by reviewing the block level data products provided by DPD and geographic data in the MAF/TIGER system. The governmental unit and DPD are informed of the resolution to its challenge. Any changes resulting from this activity are reflected in MAF/TIGER, as part of GEOP/GDP, however, the changes do not affect the apportionment or redistricting data. If an issue with the data products does arise, DPD adds a user note and provides the new data in a static table (the files are not regenerated).

## Archiving

⑧ 2020 Census data are required to be archived so that they can be released to the public 72 years after the completion of the census in accordance with Title 44 of the United States Code as amended 92 Stat. 915; Public Law 95-416, October 5, 1978. ARC is responsible for archiving 2020 Census data in accordance with the agreed-upon 2020 Census records schedule signed by NARA. This includes:

- Individual responses to the 2020 Census.
- Final records used to capture, process, and tabulate respondent data.
- Final records used to collect and update address and map information.
- Planning, management and evaluation files that document policy, decision, and information related to the census, manuals, promotional materials, and evaluation reports.

In addition, ARC stores other data for archival at the Census Bureau, including all paradata and the recruiting, payroll, personnel, hiring, retention, and time and expense data for temporary field and office staff. These data are used for research to support planning that is performed by the Evaluations and Experiments operation (EAE) for future censuses. These data also support legal inquiries related to temporary field personnel. Finally, ARC sends 2020 Census data to the National Processing Center (NPC) to support Age Search, a service to the public that is legally required.

## **2.5 DPD Design Assumptions**

- Tabulation system staff in the Decennial Information Technology Division (DITD) and the operational staff in CEDSCI will receive customer requirements for products and services within the identified timeframe that are complete and unambiguous.
- Tabulation system staff in DITD will receive microdata and corollary geographic metadata files from Center for Disclosure Avoidance Research and GEO, respectively.
- Tabulation system staff in DITD will produce tabulations and metadata with Meta tags for CEDSCI to include in the enterprise data dissemination platform.
- The enterprise data dissemination will be used to enhance data user satisfaction with its search and display functionality.
- Visualization tools will be available for Census Bureau analysts to enhance data dissemination and support search functionality.

### 3. Data Products and Dissemination Operation (DPD) Detailed Process Description

Figure 3 is a top-level Business Process Model (BPM) showing the Level 1 activity areas within the DPD operation. BPMs for the 2020 Census follow industry-standard Business Process Model and Notation (BPMN). An explanation of how to read the BPMN notations and a full sized copy of all of the BPMN diagrams for this operation are provided under separate cover.

This top-level BPM serves as the Context Model for the DPD operation. A BPMN Context Model displays the high-level activities within the operation and relationships between them, whereas the IDEF0 Context Diagram shown earlier depicts the boundaries of the operation or activity and the interfaces between the operation or activity and other operations and activities with which it is associated.

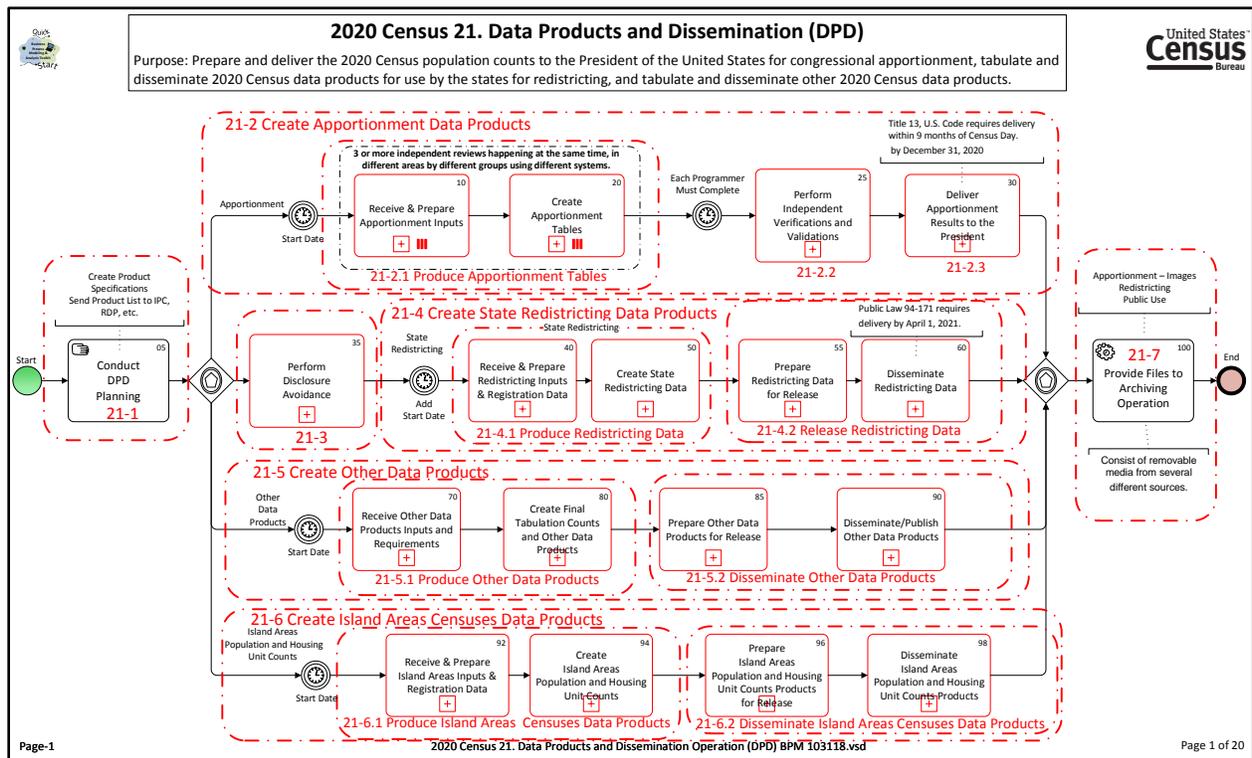


Figure 3: DPD Operation Context Model

The DPD operation is subdivided into the following Activity Areas:

- Conduct DPD Planning [DPD 21-1].
- Create Apportionment Data Products [DPD 21-2].
- Perform Disclosure Avoidance [DPD 21-3].

- Create State Redistricting Data Products [DPD 21-4].
- Create Other Data Products [DPD 21-55].
- Create Island Areas Censuses Data Products [DPD 21-6].
- Provide Files to Archiving Operation [DPD 21-7].

The business processes for each of these Level 1 activity areas are discussed along with their inputs and outputs in the following subsections.

### 3.1 Conduct DPD Planning [DPD 21-1]

Figure 4 shows the BPM for the Conduct DPD Planning [DPD 21-1] activity area (area within the gray rounded rectangle) and its activities within the overall context of the DPD operation.

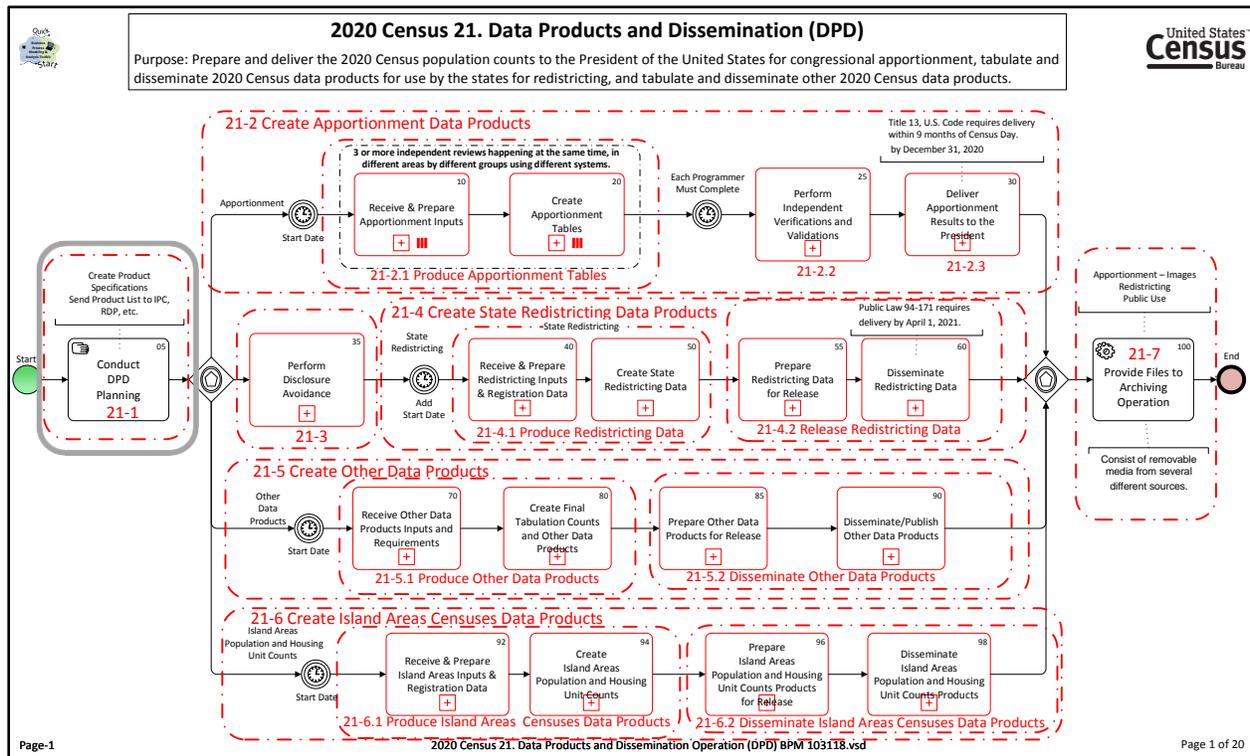


Figure 4: Conduct DPD Planning [DPD 21-1] Activities

The Census Bureau begins planning by determining the requirements and gathering data user comments on the 2020 Census Data Product Proposal. The proposal itself is a mix of standard decennial data with leveraging new solutions to allow data users greater flexibility in using 2020 Census data for research, analytics, application development, etc. The focus is on user-centric capabilities and dissemination functionality. The scope and presentation of the 2020 Census data

products for use by the states for redistricting is also dependent on external input and decisions on content (for example, race and ethnicity) and input from the states. This description supports the development of requirements and capabilities for systems and data providers and also support the overall product planning described in 2.3.1.

### 3.2 Create Apportionment Data Products [DPD 21-2]

Figure 5 shows the BPM for the Create Apportionment Data Products [DPD 21-2] activity area (area within the gray rounded rectangle) and its activities within the overall context of the DPD operation.

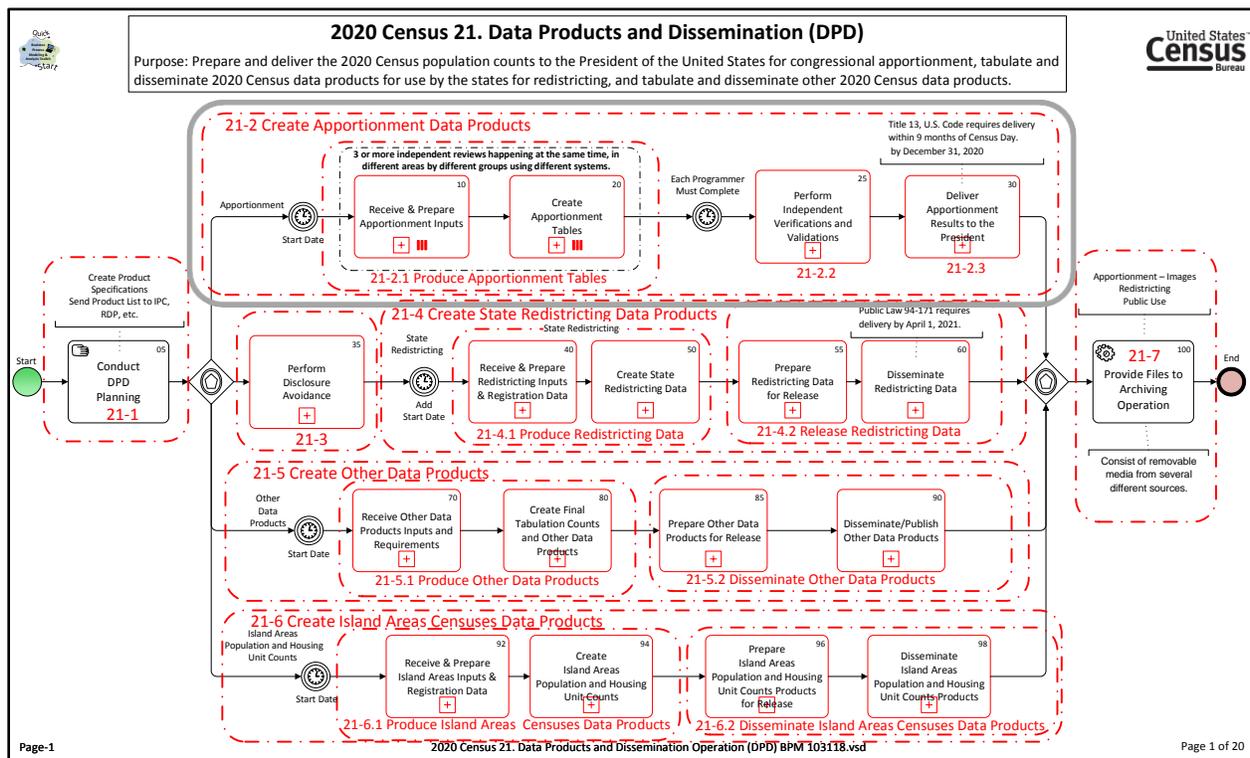


Figure 5: Create Apportionment Data Products [DPD 21-2] Activities

The Create Apportionment Data Products activity area is subdivided into the following operational subactivities:

- Create Apportionment Data Products [DPD 21-2].
  - Produce Apportionment Tables [DPD 21-2.1].
  - Perform Independent Verifications and Validations [DPD 21-2.2].
  - Deliver Apportionment Results to the President [DPD 21-2.3].

Apportionment is one of the most important functions of the decennial census. Apportionment measures the population so that seats in the U.S. House of Representatives can be correctly apportioned among the states. The apportionment for the 2020 Census will be calculated using the method of equal proportions, according to the provisions of Title 2, U.S.C. Congress decides the method used to calculate the apportionment. This method has been used in every census since the 1940 Census. Subsequent sections describe the Create Apportionment Data Products operational subactivities in detail.

### **3.2.1 Produce Apportionment Tables [DPD 21-2.1]**

The “Produce Apportionment Tables” operational subactivity is subdivided into the following activities as described below:

- Produce Apportionment Tables [DPD 21-2.1].
  - Receive & Prepare Apportionment Inputs [DPD 21-2.1.1].
  - Create Apportionment Tables [DPD 21-2.1.2].

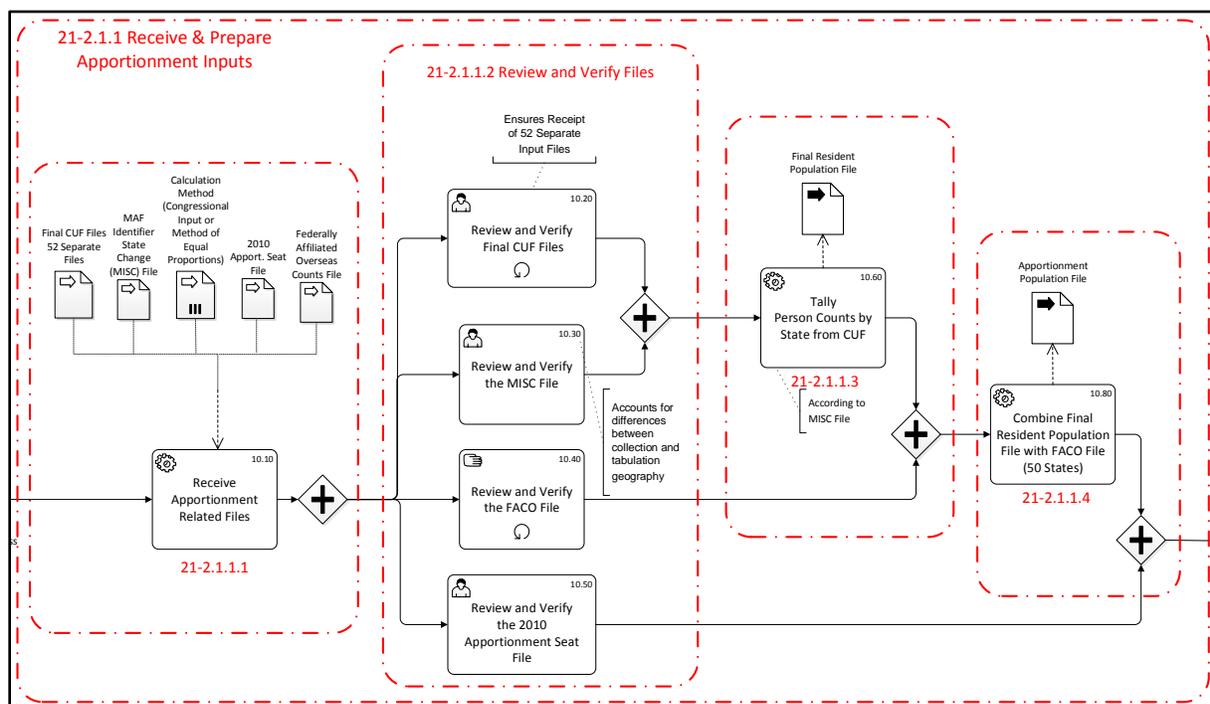
The apportionment population includes the U.S. resident population plus the counts of federally affiliated overseas population and their dependents living with them. An additional input file is also used to verify the state geocodes. The resident population (results of the 2020 Census enumeration of housing units and group quarters) is the total number of people enumerated in the CUF. The Federally Affiliated Count Overseas operation (FACO) provides the counts of federally affiliated overseas population and their dependents living with them. The GEOP provides the Master Address File Identifier State Change File (MISC file), which lists the MAFID, the collection state code, and the tabulation state code for each living quarters unit where the collection state code and the tabulation state code are NOT the same. Collection geography and the field office infrastructure and data collection activities maintain state boundaries with the exception of where enumeration involves large American Indian reservation(s), which include and cross over state boundaries. The MISC file identifies the state tabulation codes that differ from the collection codes.

The table shells for the apportionment table and other tables in the transmittal package are created for design review and comment without the data.

Subsequent sections describe the Produce Apportionment Tables operational subactivities in detail.

#### **3.2.1.1 Receive & Prepare Apportionment Inputs [DPD 21-2.1.1]**

A detailed view of the activities that make up the “Receive & Prepare Apportionment Inputs” operational subactivity is given in [Figure 6](#) below.



**Figure 6: Receive & Prepare Apportionment Inputs**

The “Receive & Prepare Apportionment Inputs” operational subactivity is subdivided into the following activities:

- Receive & Prepare Apportionment Inputs [DPD 21-2.1.1].
  - Receive Apportionment Related Files [DPD 21-2.1.1.1].
  - Review and Verify Files [DPD 21-2.1.1.2].
  - Tally Person Counts by State from CUF [DPD 21-2.1.1.3].
  - Combine Final Resident Population File with FACO File (50 States) [DPD 21-2.1.1.4].

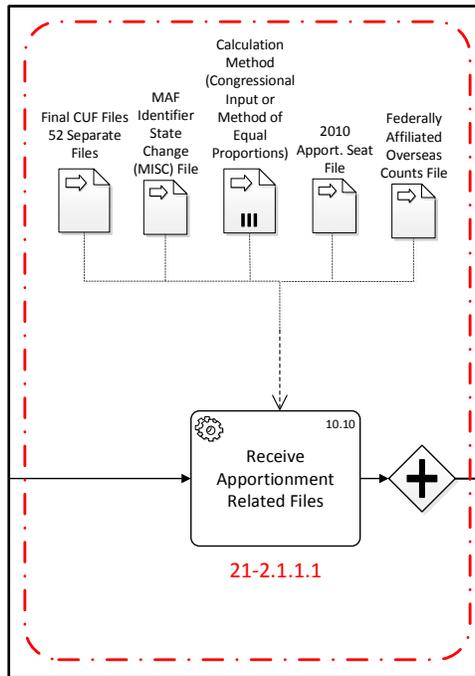
The initial CUF counts file (also called the initial resident population counts file) contains the initial resident population counts for the 50 states, plus the District of Columbia and Puerto Rico. These counts will be generated from the 2020 CUF. Programmers’ results will be verified to determine that each programmer’s result for the official 2020 Census initial resident population is identical.

The final resident population counts file contains the final resident population for each of the 50 states, plus the District of Columbia and Puerto Rico. These counts are the product of applying the MISC file to the initial CUF counts (the initial resident population counts) and represent the resident population in tabulation geography. The final resident population counts will be combined with the 2020 Census overseas counts file to create the apportionment population

counts file for the 50 states (excluding the District of Columbia and Puerto Rico). The same QC and QA are applied to each step.

***Receive Apportionment Related Files [DPD 21-2.1.1.1]***

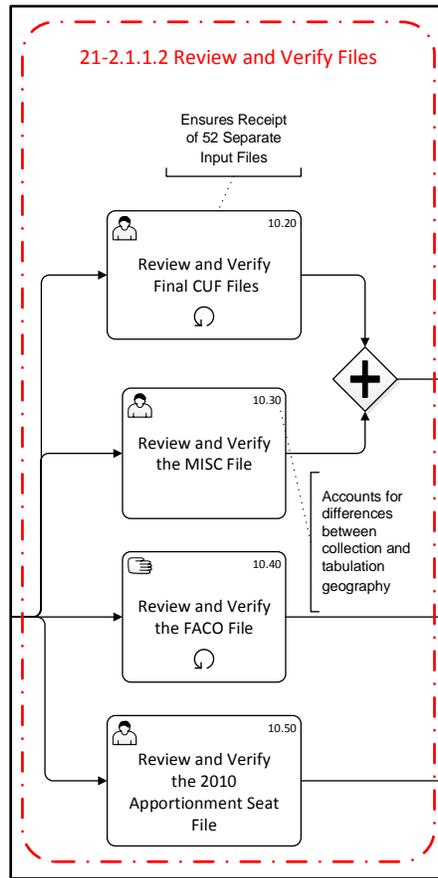
A detailed view of the activities that make up the “Receive Apportionment Related Files” operational subactivity is given in [Figure 7](#) below.



**Figure 7: Receive Apportionment Related Files**

***Review and Verify Files [DPD 21-2.1.1.2]***

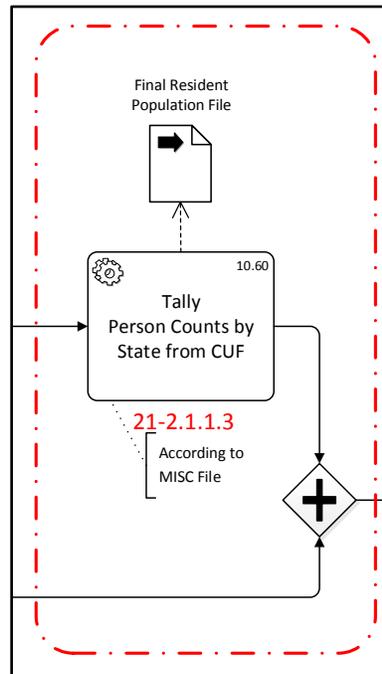
A detailed view of the constituent activities that make up the “Review and Verify Files” operational subactivity is given in [Figure 8](#) below.



**Figure 8: Review and Verify Files**

***Tally Person Counts by State from CUF [DPD 21-2.1.1.3]***

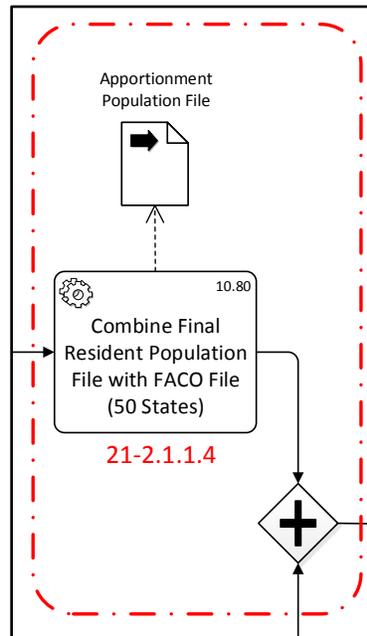
A detailed view of the activities that make up the “Tally Person Counts by State from CUF” operational subactivity is given in [Figure 9](#) below.



**Figure 9: Tally Person Counts by State from CUF**

***Combine Final Resident Population File with FACO File (50 States) [DPD 21-2.1.1.4]***

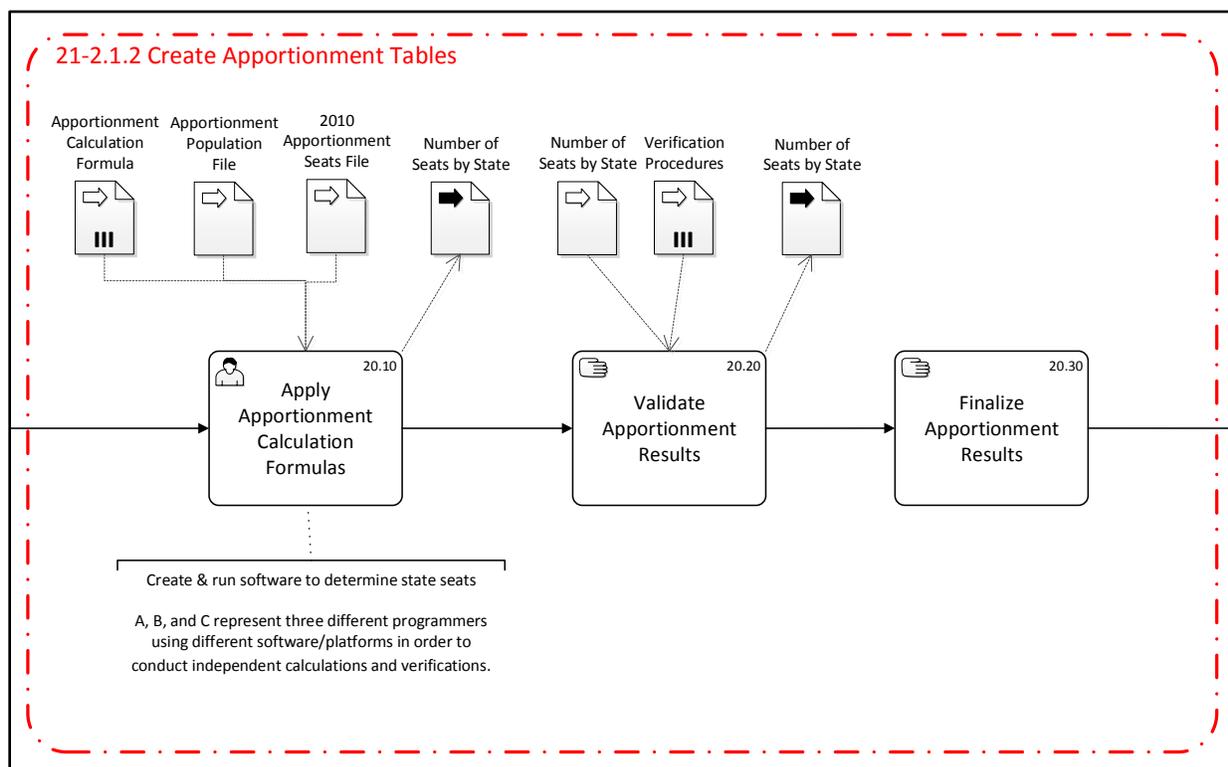
A detailed view of the activities that make up the “Combine Final Resident Population File with FACO File (50 States)” operational subactivity is given in [Figure 10](#) below.



**Figure 10: Combine Final Resident Population File with FACO File (50 States)**

### 3.2.1.2 Create Apportionment Tables [DPD 21-2.1.2]

A detailed view of the activities that make up the “Create Apportionment Tables” operational subactivity is given in [Figure 11](#) below.

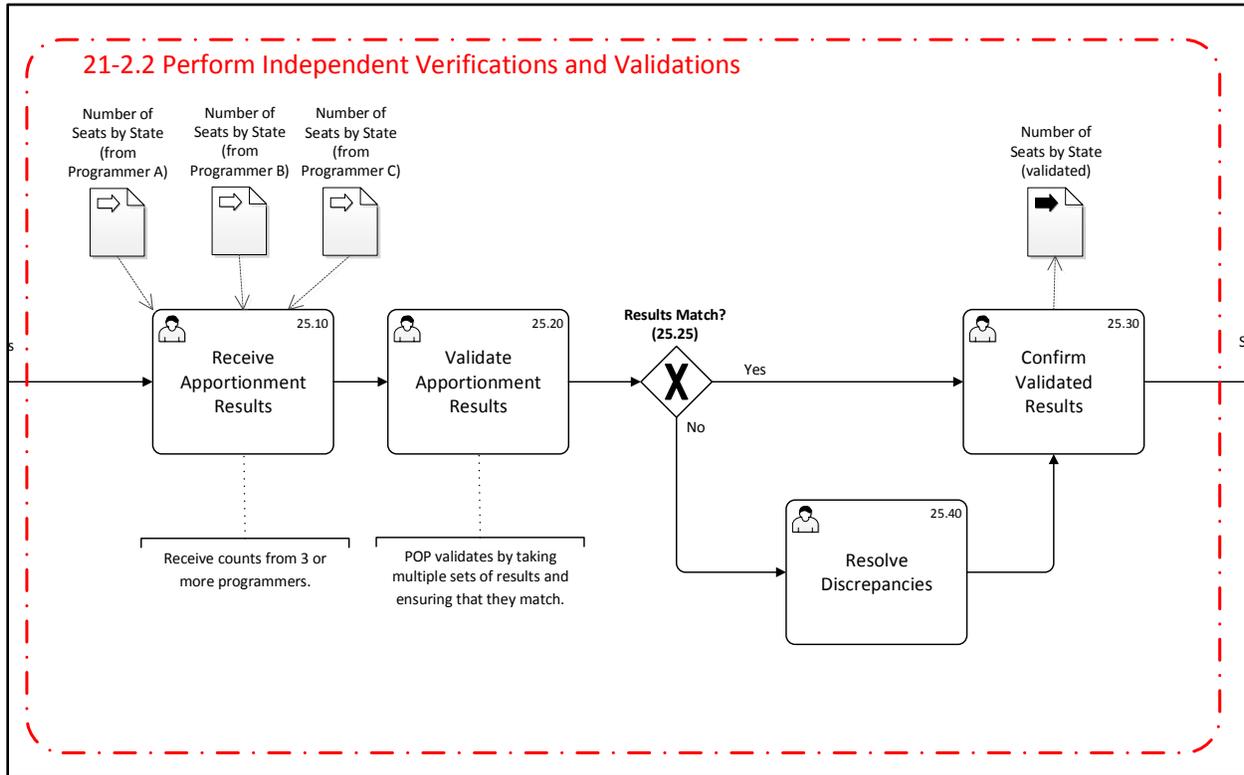


**Figure 11: Create Apportionment Tables**

Programmers will use the final resident population counts file, the overseas counts file, and the seats file from the 2010 Census as inputs to produce the tables. Each of the multiple (at least three) programmers from various areas will use different combinations of software and platforms to independently write and run a program that will apply the apportionment calculation formula (i.e., Method of Equal Proportions) to the apportionment population counts. First, each program will calculate multipliers for the 50 states. Then these multipliers will be used by the program to produce at least 60 priority values for each state. These priority values are then used by the program to determine which state gets the 51st seat, the 52nd seat, and so on, until all 435 seats are assigned according to the priority values. (To account for the first 50 seats, each program will automatically allocate one seat to each state.) The results of each independent program will lead to the 2020 Apportionment Seat results (by state), which will be compared to the 2010 Apportionment Seats file, in order to calculate the change in the number of seats each state will be allotted in the U.S. House of Representatives.

### 3.2.2 Perform Independent Verifications and Validations [DPD 21-2.2]

A detailed view of the activities that make up the “Perform Independent Verifications and Validations” operational subactivity is given in [Figure 12](#) below.

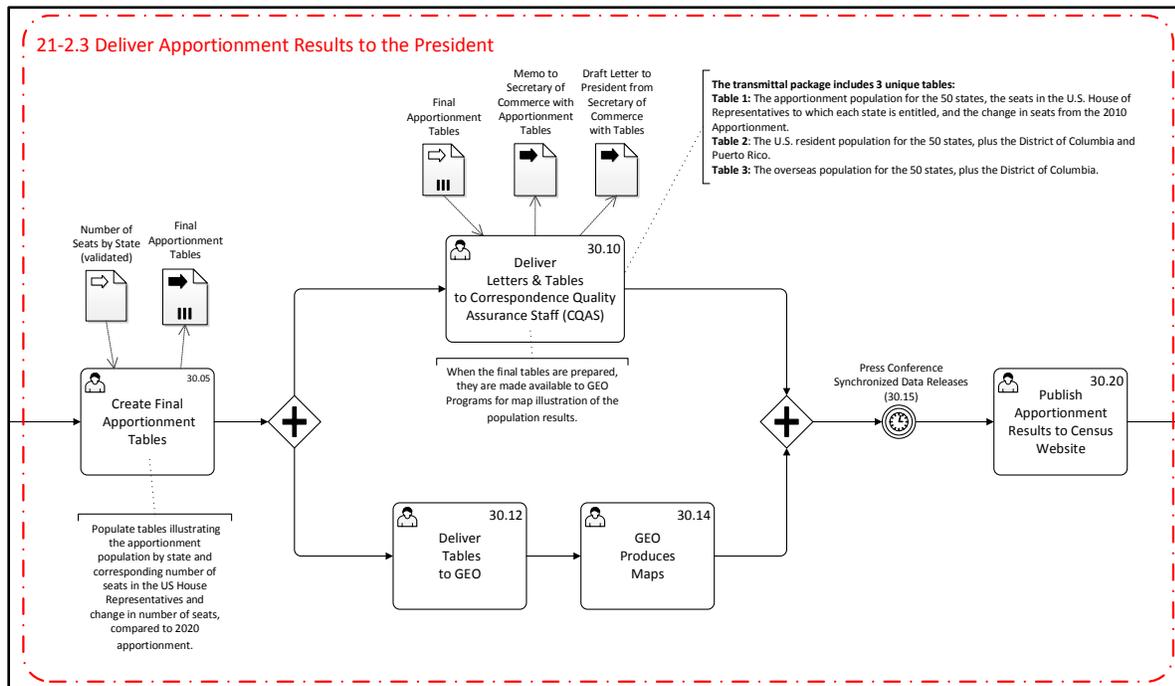


**Figure 12: Perform Independent Verifications and Validations**

The results from calculating apportionment will be verified using a variety of methods. Using programmers who independently wrote and ran their apportionment programs assures that several sets of independently derived apportionment results will be produced and then verified that the results from all of them are identical. To verify these results, Census Bureau will use both automated and clerical methods to compare each set of results to one another. All of the programmers’ files will be compared in an automated Excel spreadsheet as well as clerically (red-dotting) according to the verification procedures developed before the 2020 Census and during the 2018 End-to-End Census Test.

**3.2.3 Deliver Apportionment Results to the President [DPD 21-2.3]**

A detailed view of the activities that make up the “Deliver Apportionment Results to the President” operational subactivity is given in [Figure 13](#) below.



**Figure 13: Deliver Apportionment Results to the President**

The 2020 Apportionment results (outputs) will be used to create the tables that will be included in the 2020 Apportionment Transmittal Package that will be delivered to the Secretary of Commerce. NOTE: the 2020 package is not designed or finalized. The following tables were included in the 2010 Census package.

- Table 1: The apportionment population for the 50 states, the number of seats in the U.S. House of Representatives to which each state is entitled, and the change in number of seats from the 2010 Census Apportionment.
- Table 2: The U.S. resident population for the 50 states, plus the District of Columbia and Puerto Rico.
- Table 3: The overseas population for the 50 states, plus the District of Columbia.

The official 2020 Apportionment results tables (content and number still to be determined) will be incorporated into the Transmittal Package that is hand-delivered by the Census Bureau’s Director to the Secretary of Commerce, and the Secretary of Commerce hand-delivers the Transmittal Package to the President. The Secretary of Commerce receives Tables 1-3, however, by law the Census Bureau is only required to deliver Table 1 to the President.

### 3.3 Perform Disclosure Avoidance [DPD 21-3]

Figure 14 shows the BPM for the Perform Disclosure Avoidance [DPD 21-3] activity area (area within the gray rounded rectangle) and its activities within the overall context of the DPD operation.

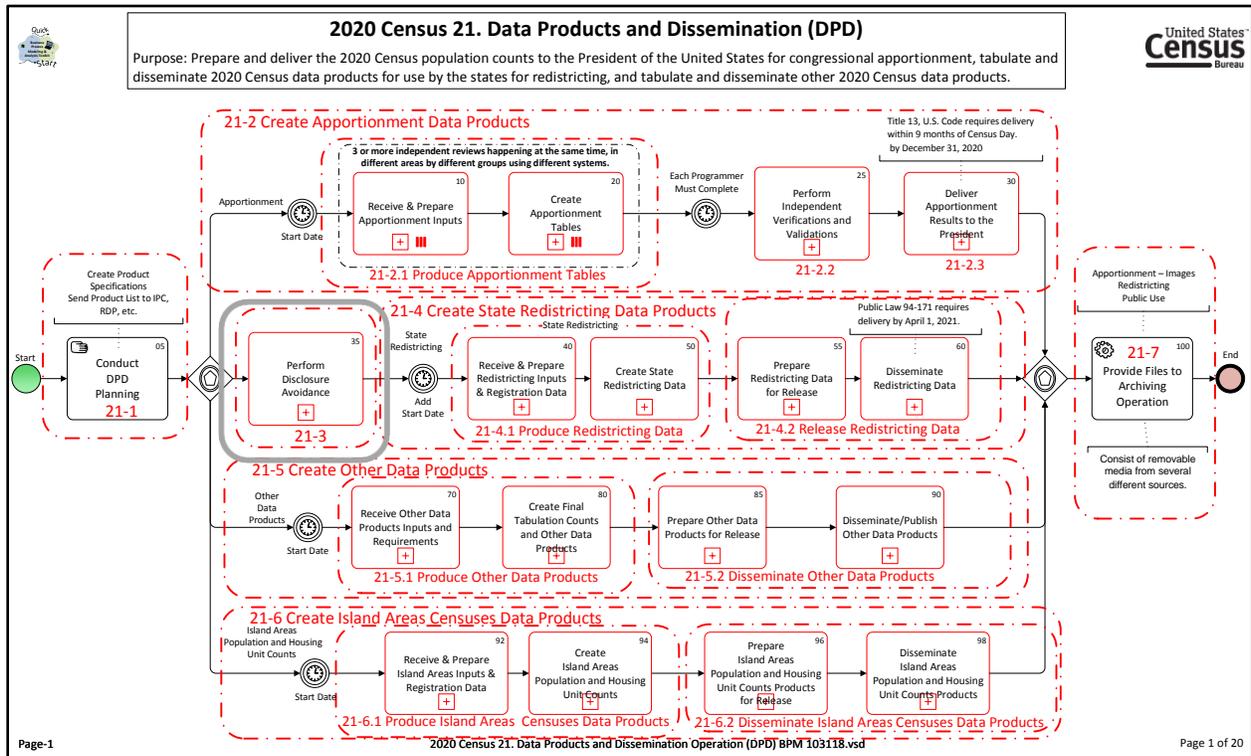
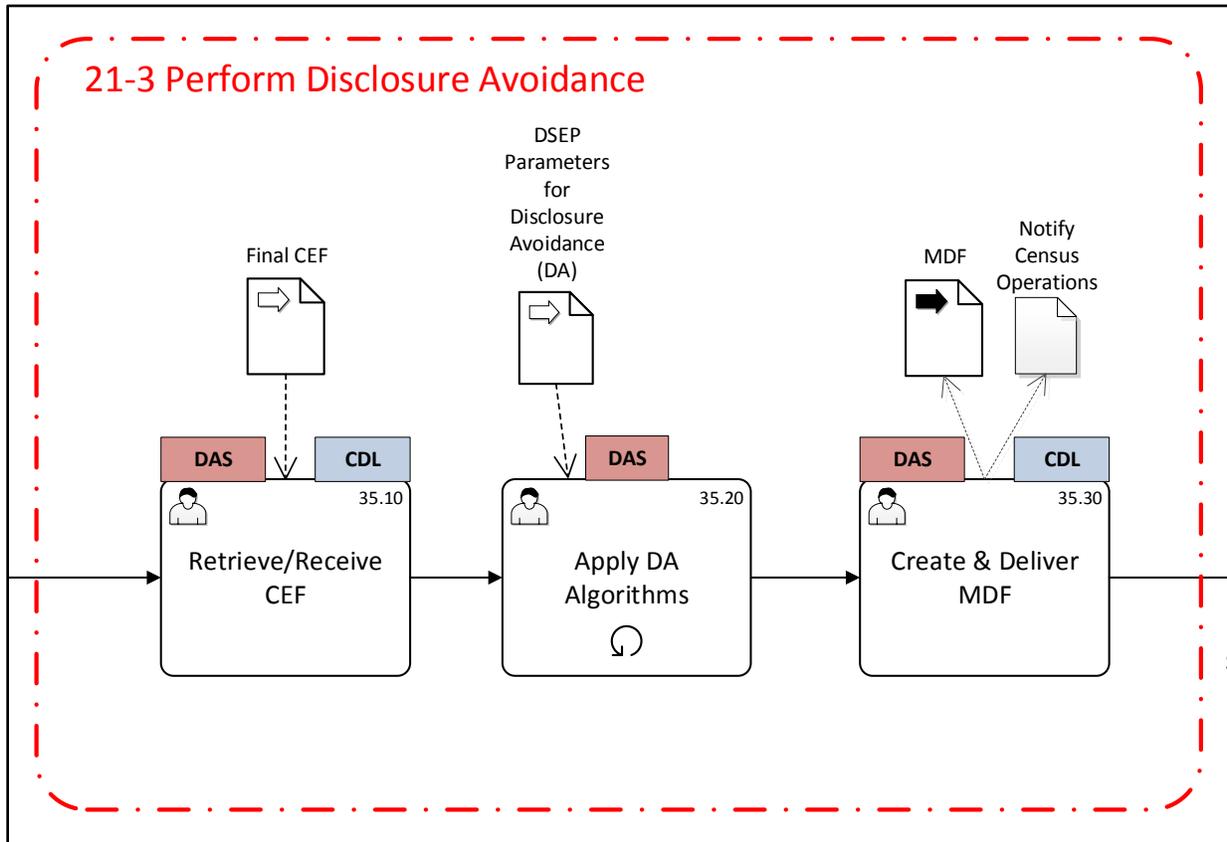


Figure 14: Perform Disclosure Avoidance [DPD 21-3] Activities

A detailed view of the activities that make up the “Perform Disclosure Avoidance” operational subactivity is given in Figure 15 below.



**Figure 15: Perform Disclosure Avoidance**

The 2000 and 2010 Disclosure Avoidance Systems relied on swapping households. Data swapping is a method of disclosure avoidance designed to protect confidentiality in tables of frequency data (the number or percentage of the population with certain characteristics) and is done by editing the source data or exchanging records for a sample of cases.

The advantages of swapping include:

- Easy to understand.
- Does not affect state counts.
- Can be run state-by-state.
- Operation is “invisible” to the rest of census processing.

The disadvantages of swapping are:

- Does not consider or protect against database reconstruction attacks.
- Swap rate and details of swapping must remain confidential.
- Privacy guarantee based on the lack of external data.

While the risk of database reconstruction has been understood for decades and wasn't a realistic threat in years past, recent research has proven the situation is otherwise. Therefore, the 2020 Census disclosure avoidance system will use differential privacy to defend against disclosure ("reconstruction attack"). Adding noise doesn't make database reconstruction impossible. Instead, it makes it so that there is no way to tell if the reconstructed database is correct or not.

Differential privacy provides:

- Provable bounds on the accuracy of the best possible database reconstruction given the released tabulations.
- Algorithms that allow policy makers to decide the trade-off between accuracy and privacy.

And the advantages include:

- Privacy guarantees are *tunable and provable*.
- Privacy guarantees are *future-proof*.
- Privacy guarantees are *public and explainable*.
- Protects against *database reconstruction*.

Disadvantages include:

- Entire country must be processed at once for best accuracy.
- Every use of private data must be tallied in the *privacy-loss budget*.

The Data Stewardship Executive Policy Committee (DSEP) will approve the privacy loss budget (epsilon).

### 3.4 Create State Redistricting Data Products [DPD 21-4]

Figure 16 shows the BPM for the Create State Redistricting Data Products [DPD 21-4] activity area (area within the gray rounded rectangle) and its activities within the overall context of the DPD operation.

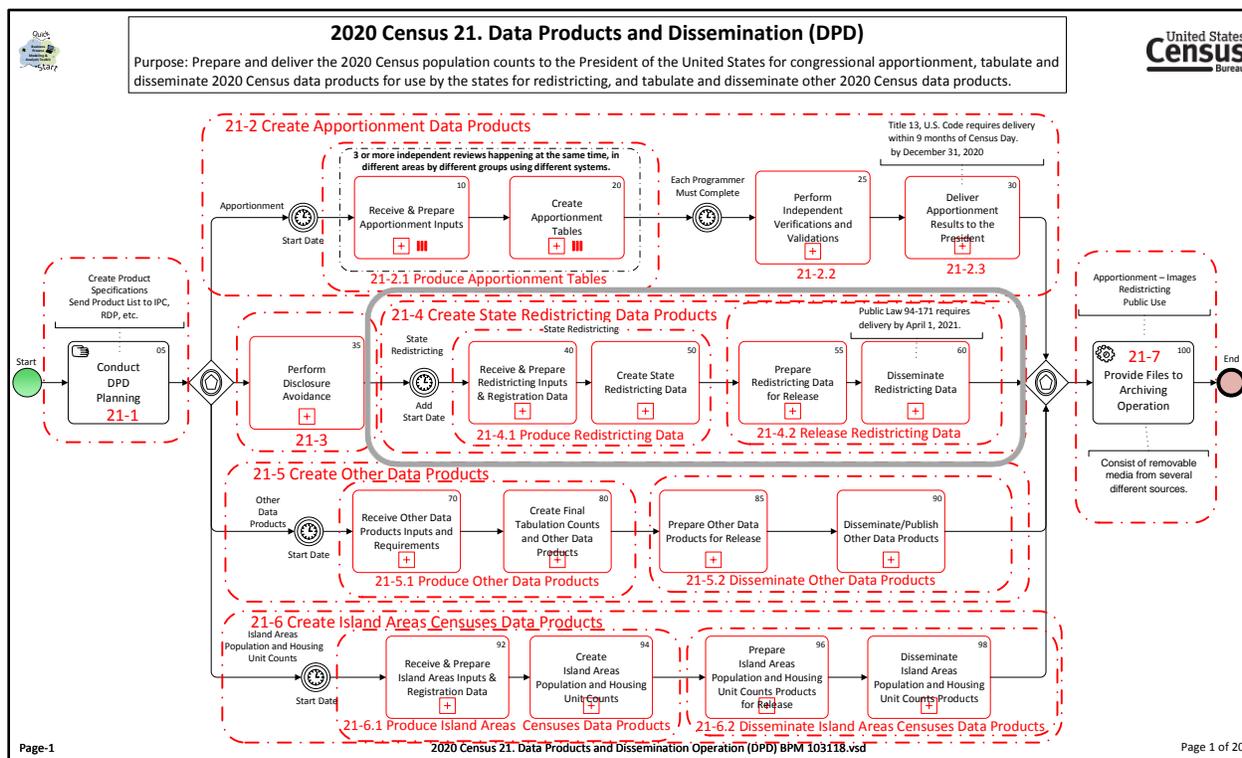


Figure 16: Create State Redistricting Data Products [DPD 21-4] Activities

The Create State Redistricting Data Products activity area is subdivided into the following operational subactivities:

- Create State Redistricting Data Products [DPD 21-4].
  - Produce Redistricting Data [DPD 21-4.1].
  - Release Redistricting Data [DPD 21-4.2].

Redistricting data product is generated by the DPD for the Redistricting Data Program operation (RDP), which provides the data and confirms its delivery to each state’s governor and legislative leaders with pertinent census population totals and other congressional, state, and local redistricting data, in order to fulfill the requirements of Public Law 94-171.

Subsequent sections describe the Create State Redistricting Data Products operational subactivities in detail.

### 3.4.1 Produce Redistricting Data [DPD 21-4.1]

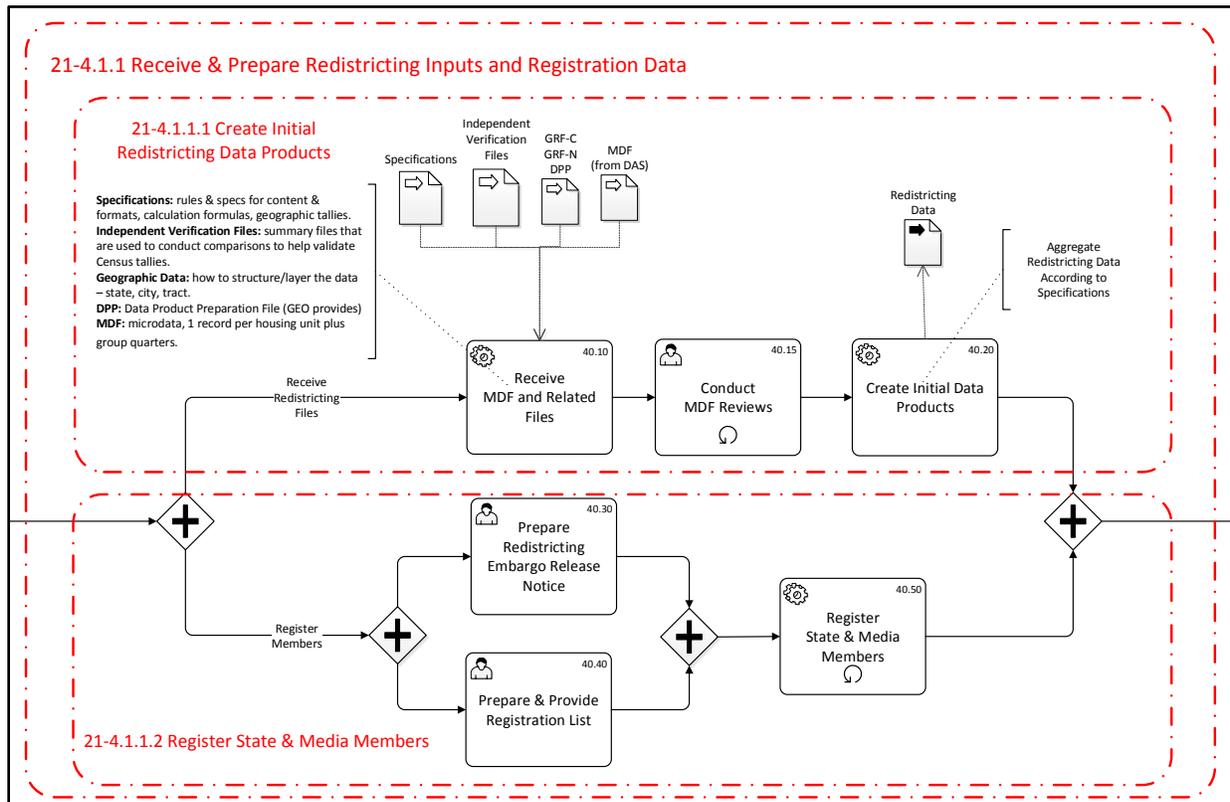
The “Produce Redistricting Data” operational subactivity is subdivided into the following activities as described below:

- Produce Redistricting Data [DPD 21-4.1].
  - Receive & Prepare Redistricting Inputs and Registration Data [DPD 21-4.1.1].
  - Create State Redistricting Data [DPD 21-4.1.2].

Subsequent sections describe the Produce Redistricting Data operational subactivities in detail.

#### 3.4.1.1 Receive & Prepare Redistricting Inputs and Registration Data [DPD 21-4.1.1]

A detailed view of the activities that make up the “Receive & Prepare Redistricting Inputs and Registration Data” operational subactivity is given in [Figure 17](#) below.



**Figure 17: Receive & Prepare Redistricting Inputs and Registration Data**

The “Receive & Prepare Redistricting Inputs and Registration Data” operational subactivity is subdivided into the following activities:

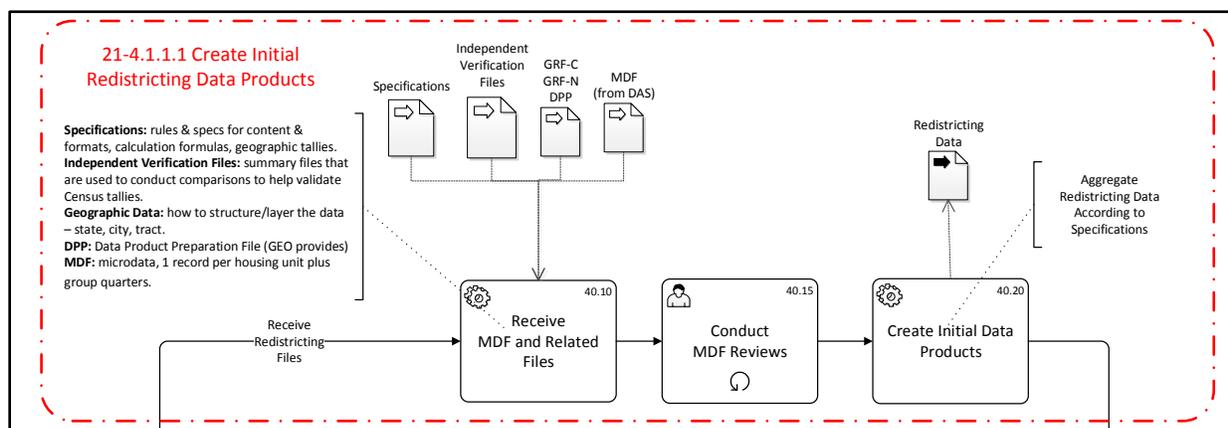
- Receive & Prepare Redistricting Inputs and Registration Data [DPD 21-4.1.1].
  - Create Initial Redistricting Data Products [DPD 21-4.1.1.1].
  - Register State & Media Members [DPD 21-4.1.1.2].

The Tabulation System is an enterprise solution that serves both the American Community Survey tabulation processing and the 2020 Census data product preparation and tabulation. Input files include geography metadata, the edited demographic and housing characteristics with privacy protection (the MDF), independent verification files, and the table specifications. The RDP requests that the states determine and provide the list of recipients for the data product when disseminated. DPD and the Public Information Office also determine the list of media members for embargoed access to the data following the confirmation of state receipt of the data. The registration process is an input for the user-name restricted access for receipt and embargo.

Subsequent sections describe the Receive & Prepare Redistricting Inputs and Registration Data operational subactivities in detail.

### ***Create Initial Redistricting Data Products [DPD 21-4.1.1.1]***

A detailed view of the activities that make up the “Create Initial Redistricting Data Products” operational subactivity is given in [Figure 18](#) below.



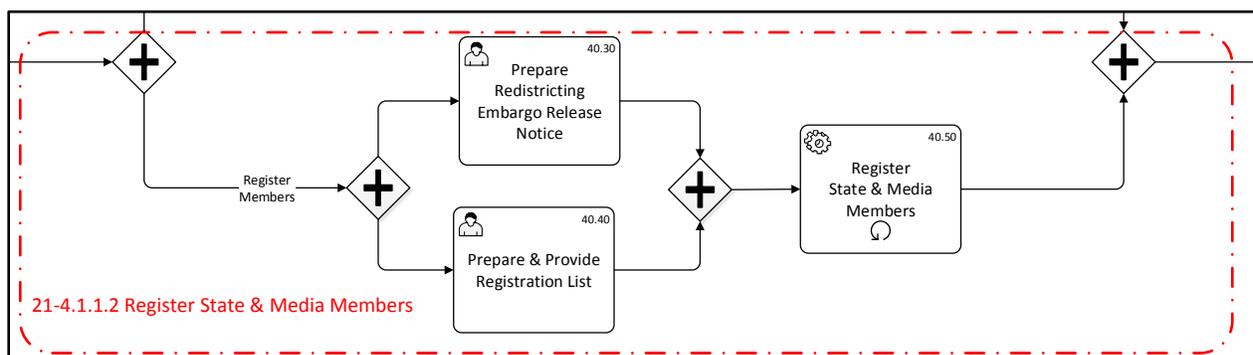
**Figure 18: Create Initial Redistricting Data Products**

Input files include the table specifications, any product overview requirements, and independent verification files for the reviewers to use. The geography metadata include the two geographic reference files (GRF-C contains codes, and the GRF-N contains the names and text identifiers).

The Data Product Preparation File contains additional metadata necessary for the tabulation system. The edited demographic and housing characteristics (the MDF) are also provided to the Tabulation system. The initial aggregation of data according to the specifications and geographic metadata take place.

### **Register State & Media Members [DPD 21-4.1.1.2]**

A detailed view of the activities that make up the “Register State & Media Members” operational subactivity is given in [Figure 19](#) below.



**Figure 19: Register State & Media Members**

The RDP requests that the states determine and provide the list of recipients for the data product when disseminated. DPD and the Public Information Office also determine the list of media members for embargoed access to the data following the confirmation for State receipt of the data. The registration process is an input for the user-name restricted access for receipt and embargo.

### **3.4.1.2 Create State Redistricting Data [DPD 21-4.1.2]**

A detailed view of the activities that make up the “Create State Redistricting Data” operational subactivity is given in [Figure 20](#) below.

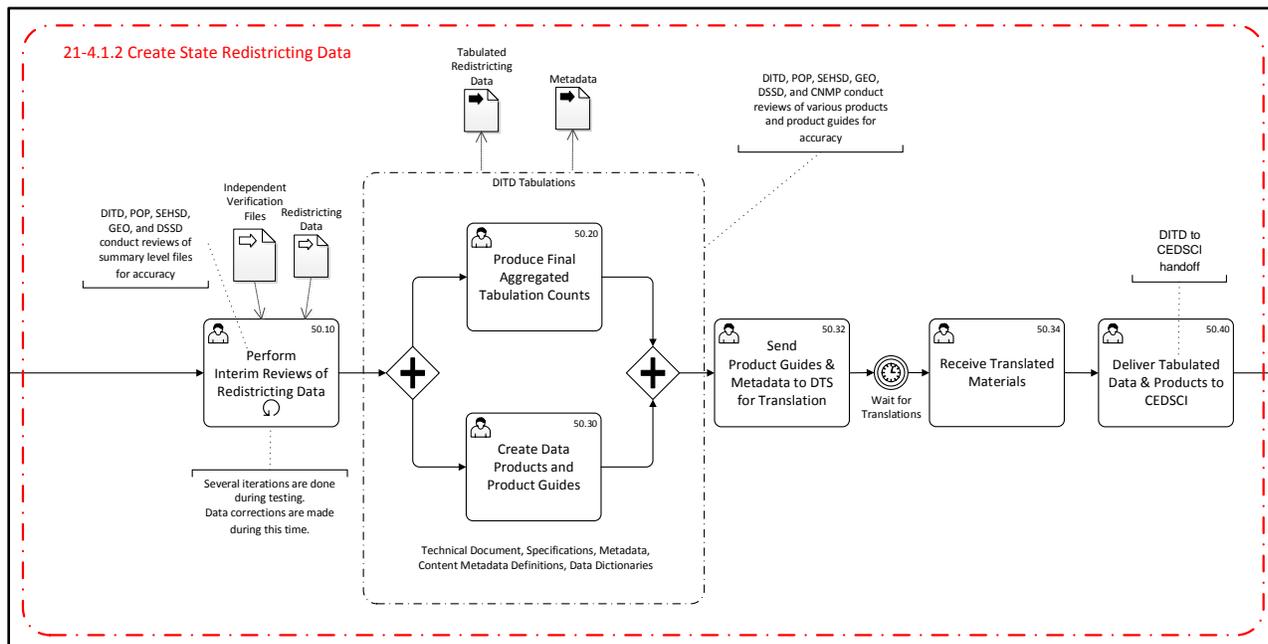


Figure 20: Create State Redistricting Data

The Tabulation System aggregated the data according to the table specifications, which includes the presentation of geographic hierarchies and metadata. The data summaries are reviewed by staff in the Census Bureau’s Population Division (POP) and Social Economic and Housing Statistics Division (SEHSD) as well as peer reviewed in DITD after the initial aggregation of data described in Figure 20 above. The 2020 Census Tabulation staff also include attributes and metadata as required by CEDSCI for public dissemination through the Census Bureau data platform. The data is provided to CEDSCI according to the enterprise ICD.

### 3.4.2 Release Redistricting Data [DPD 21-4.2]

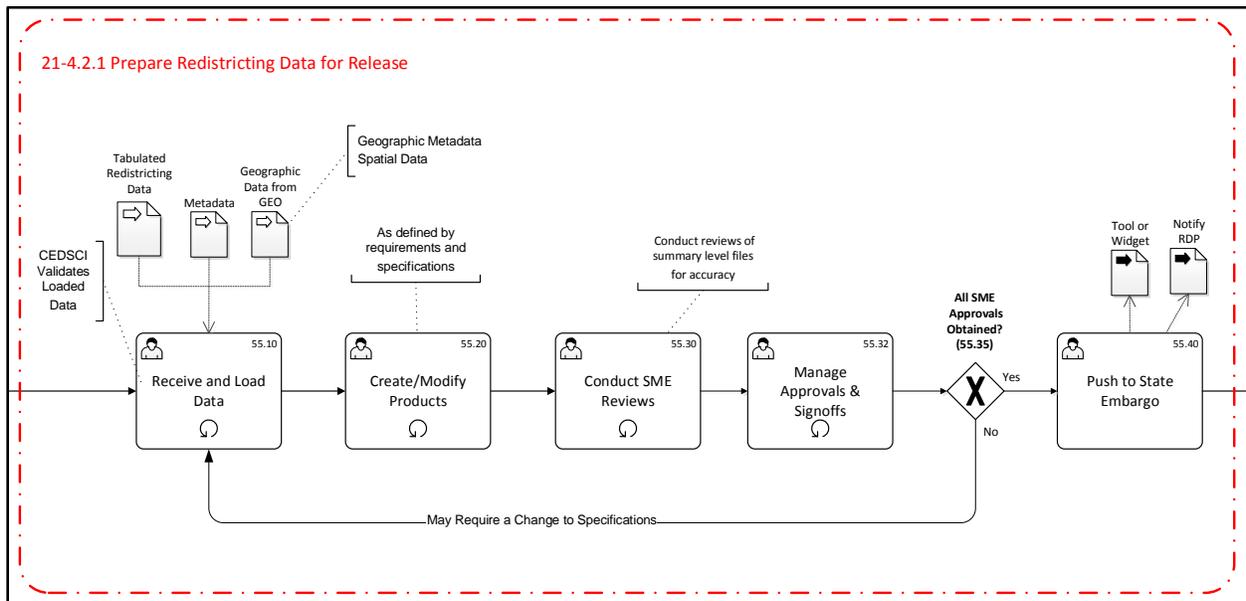
The “Release Redistricting Data” operational subactivity is subdivided into the following activities as described below:

- Release Redistricting Data [DPD 21-4.2].
  - Prepare Redistricting Data for Release [DPD 21-4.2.1].
  - Disseminate Redistricting Data [DPD 21-4.2.2].

Subsequent sections describe the Release Redistricting Data operational subactivities in detail.

### 3.4.2.1 Prepare Redistricting Data for Release [DPD 21-4.2.1]

A detailed view of the activities that make up the “Prepare Redistricting Data for Release” operational subactivity is given in [Figure 21](#) below.

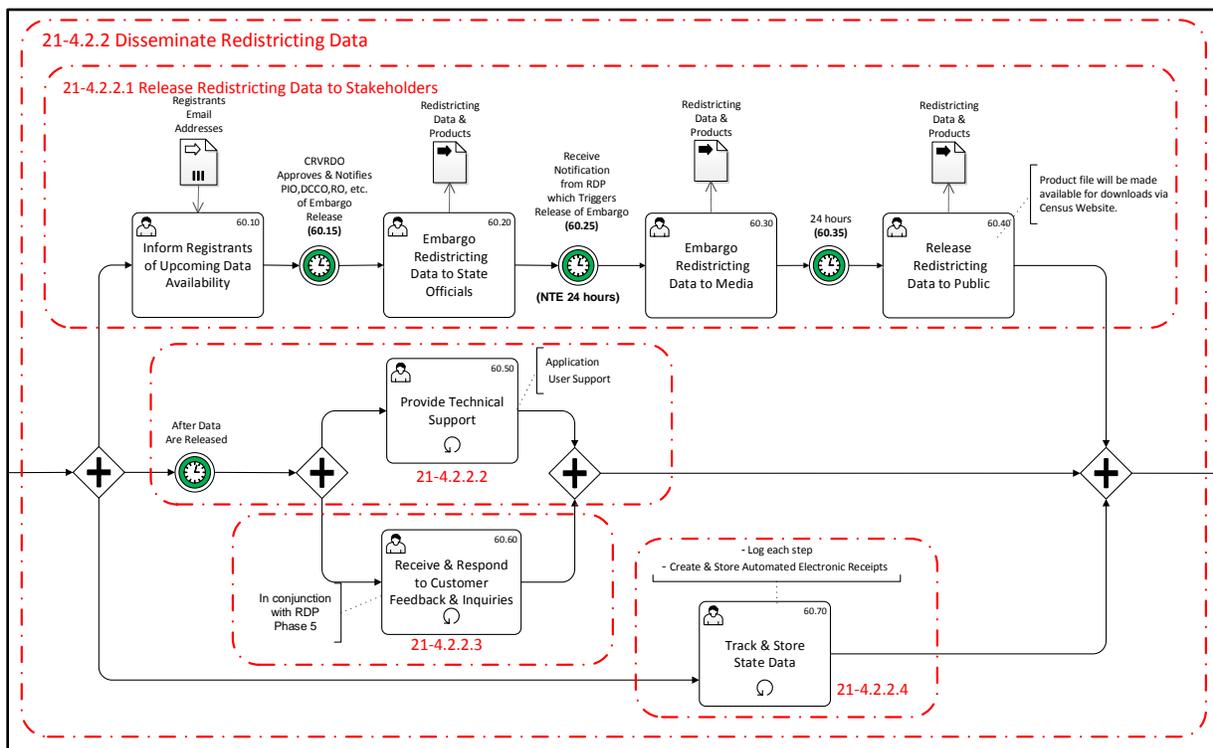


**Figure 21: Prepare Redistricting Data for Release**

The data are loaded and reviewed for their presentation (verifying the metadata and table formatting). The sign-off process of approvals launches (pushes) the data to State Embargo (designated state recipients).

### 3.4.2.2 Disseminate Redistricting Data [DPD 21-4.2.2]

A detailed view of the activities that make up the “Disseminate Redistricting Data” operational subactivity is given in [Figure 22](#) below.



**Figure 22: Disseminate Redistricting Data**

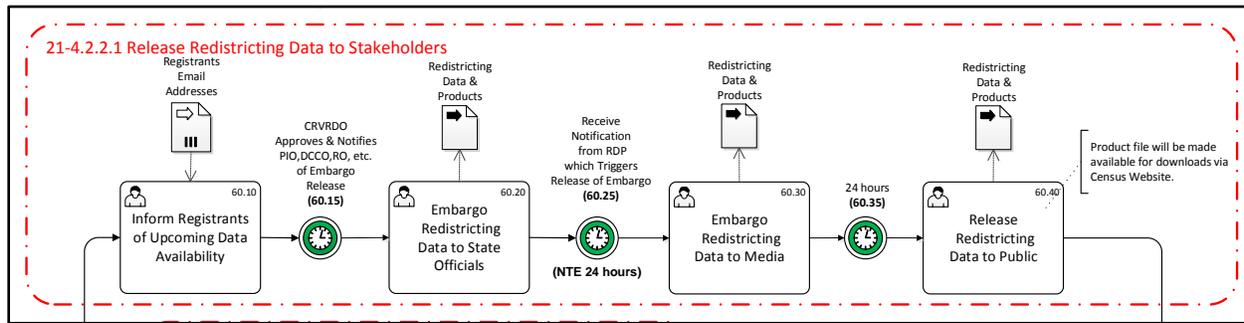
The “Disseminate Redistricting Data” operational subactivity is subdivided into the following activities:

- Disseminate Redistricting Data [DPD 21-4.2.2].
  - Release Redistricting Data to Stakeholders [DPD 21-4.2.2.1].
  - Provide Technical Support [DPD 21-4.2.2.2].
  - Receive & Respond to Customer Feedback and Inquiries [DPD 21-4.2.2.3].
  - Track & Store State Data [DPD 21-4.2.2.4].

Subsequent sections describe the Disseminate Redistricting Data operational subactivities in detail.

***Release Redistricting Data to Stakeholders [DPD 21-4.2.2.1]***

A detailed view of the activities that make up the “Release Redistricting Data to Stakeholders” operational subactivity is given in [Figure 23](#) below.

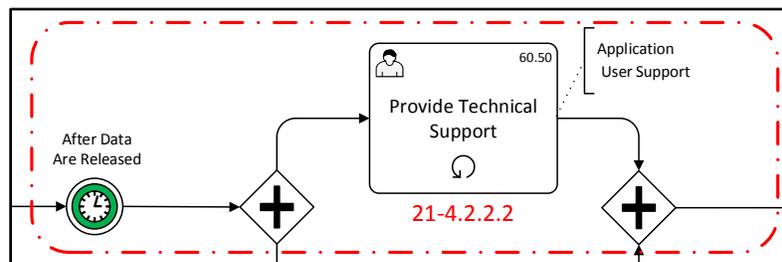


**Figure 23: Release Redistricting Data to Stakeholders**

The first embargo period is dedicated to the state (designated) officials. The RDP manages the communication with the state officials and with the DPD (for status within the Census Bureau leadership, Decennial Communications Coordination Office [DCCO], and the Public Information Office [PIO]). The RDP uses Census Bureau systems and direct communication with the state officials to confirm receipt, which in turn prompts the trigger for the second embargo to the media. The release to the public follows the 24-hour media embargo.

***Provide Technical Support [DPD 21-4.2.2.2]***

A detailed view of the activities that make up the “Provide Technical Support” operational subactivity is given in Figure 24 below.

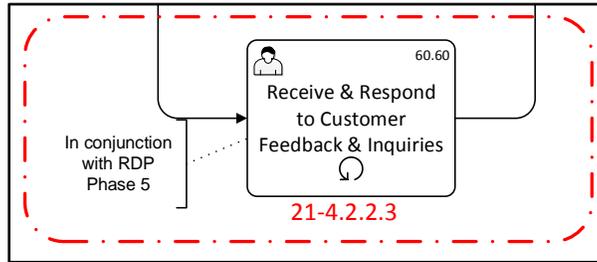


**Figure 24: Provide Technical Support**

The Census Bureau is working to minimize instances where technical (application) support is necessary, but this customer service component is included in the operational plan.

***Receive & Respond to Customer Feedback and Inquiries [DPD 21-4.2.2.3]***

A detailed view of the activities that make up the “Receive & Respond to Customer Feedback and Inquiries” operational subactivity is given in Figure 25 below.

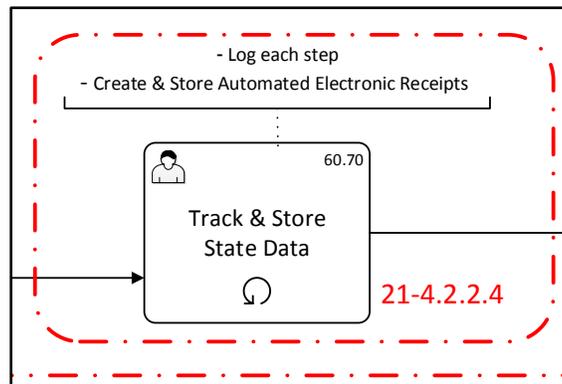


**Figure 25: Receive & Respond to Customer Feedback and Inquiries**

The RDP and DPD will respond to feedback from state and local recipients as well as all data users with respect to our documentation and processes.

***Track & Store State Data [DPD 21-4.2.2.4]***

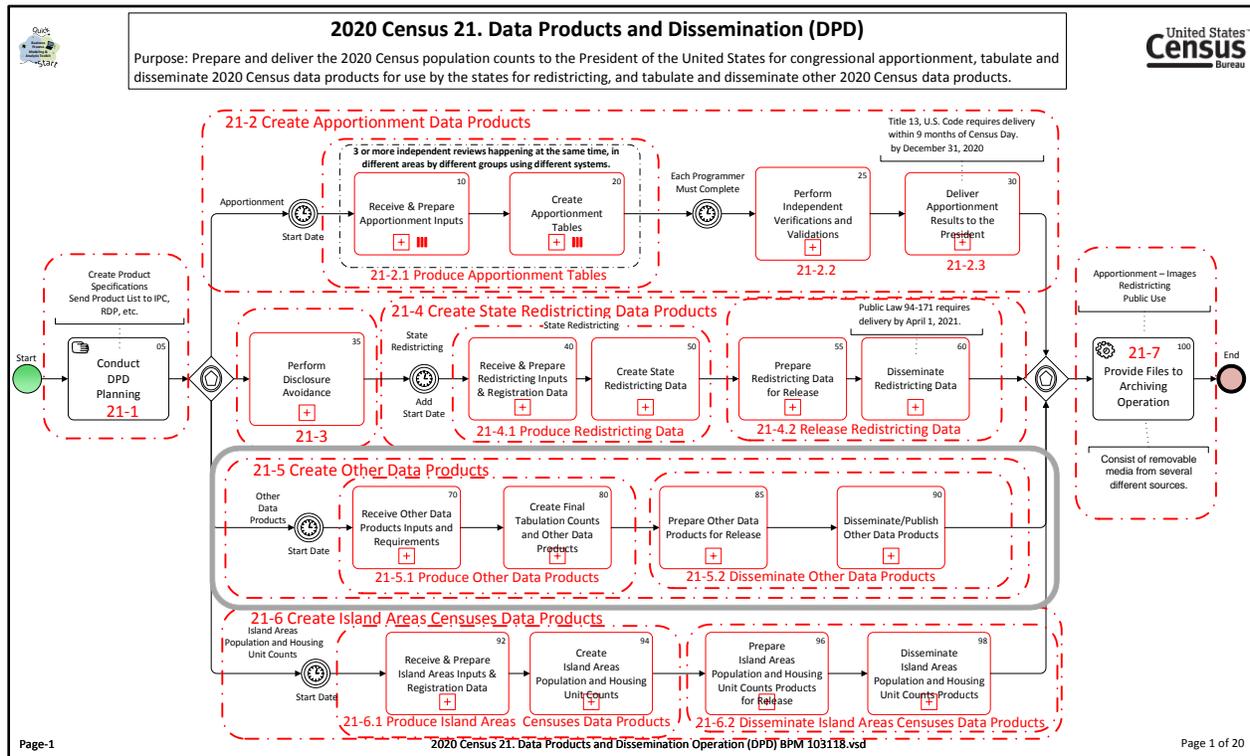
A detailed view of the activities that make up the “Track & Store State Data” operational subactivity is given in [Figure 26](#) below.



**Figure 26: Track & Store State Data**

**3.5 Create Other Data Products [DPD 21-5]**

[Figure 27](#) shows the BPM for the Create Other Data Products [DPD 21-5] activity area (area within the gray rounded rectangle) and its activities within the overall context of the DPD operation.



**Figure 27: Create Other Data Products [DPD 21-5] Activities**

The Create Other Data Products activity area is subdivided into the following operational subactivities:

- Create Other Data Products [DPD 21-5].
  - Produce Other Data Products [DPD 21-5.1].
  - Disseminate Other Data Products [DPD 21-5.2].

The previous section on data products planning [21-1] described the assessment of 2010 Census products and the inclusion of innovation and new products as the scope of the 2020 Census Data Products Proposal. Several data products likely to be proposed include decennial datasets such as: demographic profiles, Summary File 1 showing population and housing unit characteristics, Summary File 2 showing population and occupied housing unit characteristics iterated by race/Hispanic origin/American Indian and Alaska Native tribe categories, summary files for Congressional districts and state legislative districts as boundaries change and are submitted to the Census Bureau, and an American Indian and Alaska Native summary file. Additional tabulations to support estimation of coverage (population and housing) based on the estimation results from the Post-Enumeration Survey (PES) and the product array for Island Areas (profiles and summary files) are also included in “Other Data Products.”

Subsequent sections describe the Create Other Data Products operational subactivities in detail.

### **3.5.1 Produce Other Data Products [DPD 21-5.1]**

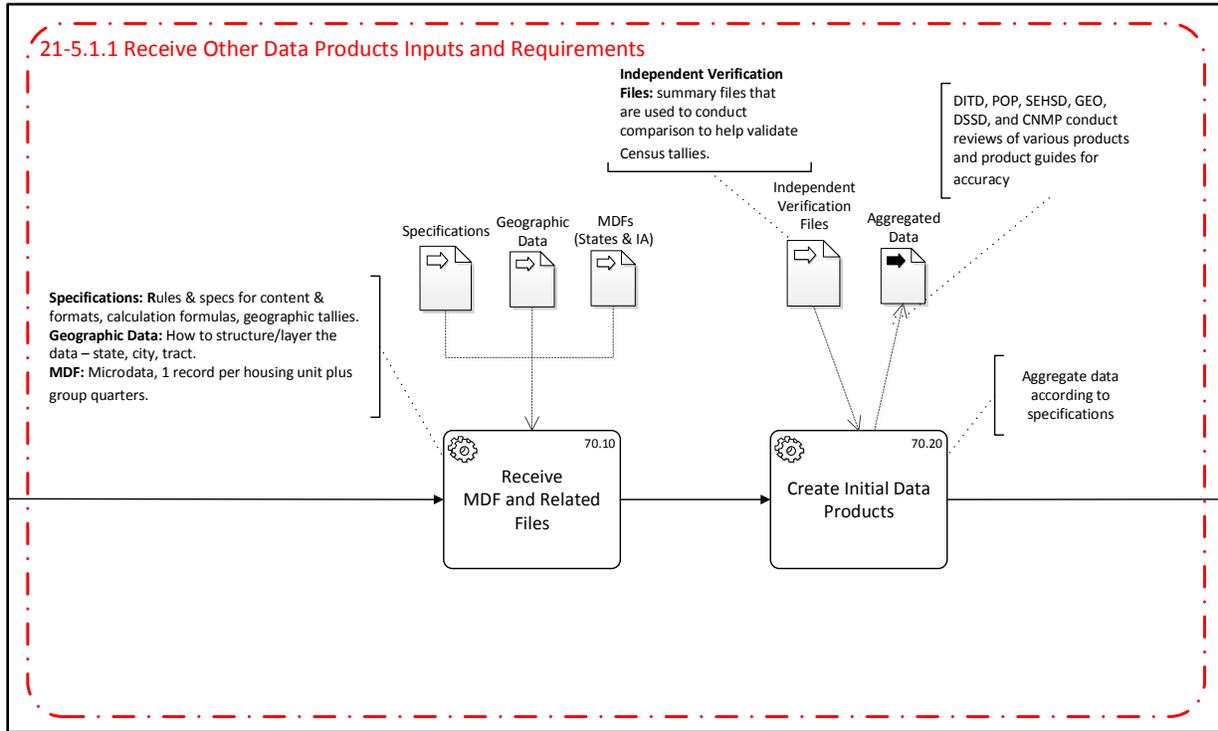
The “Produce Other Data Products” operational subactivity is subdivided into the following activities as described below:

- Produce Other Data Products [DPD 21-5.1].
  - Receive Other Data Products Inputs and Requirements [DPD 21-5.1.1].
  - Create Final Tabulation Counts and Other Data Products [DPD 21-5.1.2].

The tabulation system and its processing are repeatable for the variety of data products probably included in the plan for basic 2020 Census data sets. The decision to use the ACSO Tabulation system followed the successful tabulation of two of the three 2010 Census data sets (P.L. 94-171 and SF-2). The third product (SF-1 retabulation for 115th Congress) is taking place in 2017. Subsequent sections describe the Produce Other Data Products operational subactivities in detail.

#### **3.5.1.1 Receive Other Data Products Inputs and Requirements [DPD 21-5.1.1]**

A detailed view of the activities that make up the “Receive Other Data Products Inputs and Requirements” operational subactivity is given in [Figure 28](#) below.

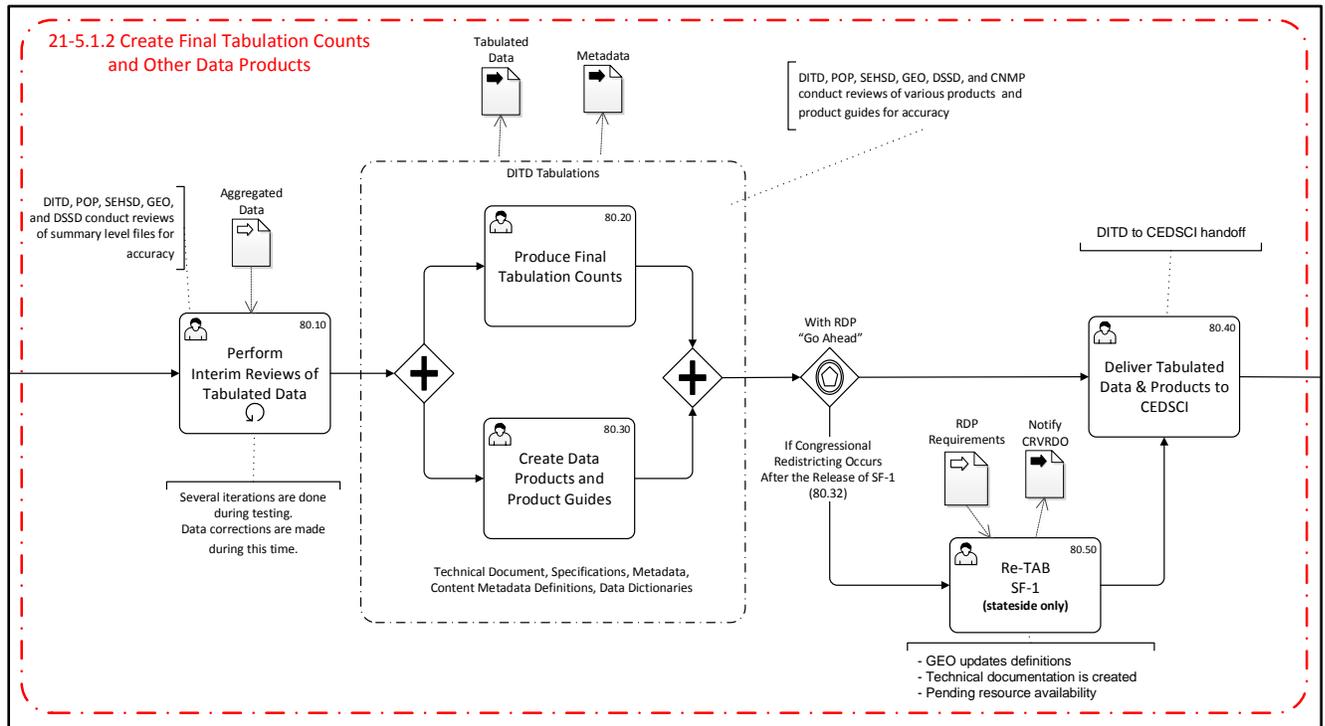


**Figure 28: Receive Other Data Products Inputs and Requirements**

The Tabulation System is an enterprise solution that serves provides the solution for the 2020 Census data product preparation and tabulation. Input files include microdata detail files (MDFs) for the 50 states, Puerto Rico, D.C., the four Island Areas, geography metadata, additional estimates for coverage of demographic and housing characteristics, independent verification files, and the table specifications.

**3.5.1.2 Create Final Tabulation Counts and Other Data Products [DPD 21-5.1.2]**

A detailed view of the activities that make up the “Create Final Tabulation Counts and Other Data Products” operational subactivity is given in [Figure 29](#) below.



**Figure 29: Create Final Tabulation Counts and Other Data Products**

### 3.5.2 Disseminate Other Data Products [DPD 21-5.2]

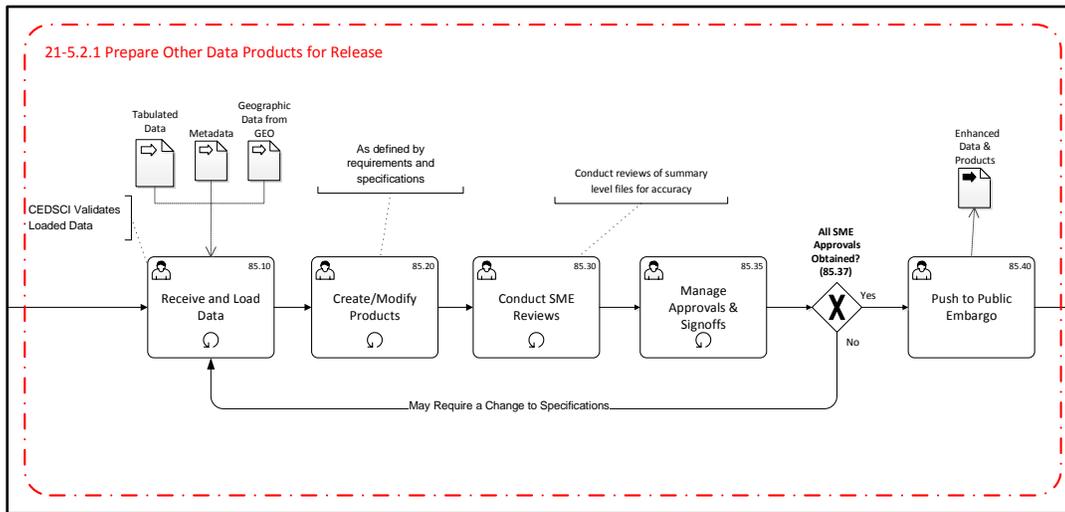
The “Disseminate Other Data Products” operational subactivity is subdivided into the following activities as described below:

- Disseminate Other Data Products [DPD 21-5.2].
- Prepare Other Data Products for Release [DPD 21-5.2.1].
- Disseminate/Publish Other Data Products [DPD 21-5.2.2].

Subsequent sections describe the Disseminate Other Data Products operational subactivities in detail.

#### 3.5.2.1 Prepare Other Data Products for Release [DPD 21-5.2.1]

A detailed view of the activities that make up the “Prepare Other Data Products for Release” operational subactivity is given in [Figure 30](#) below.

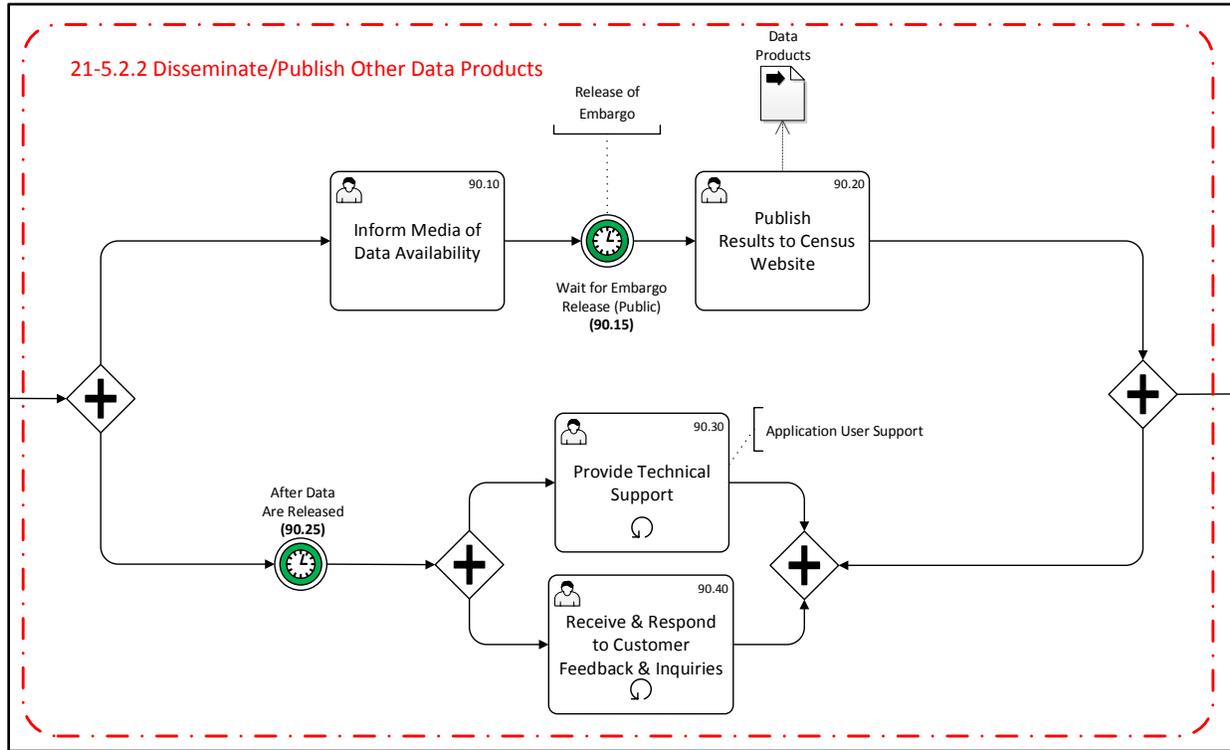


**Figure 30: Prepare Other Data Products for Release**

The data are loaded and reviewed for their presentation (verifying the metadata and table formatting). The sign-off process of approvals launches (pushes) the data to media and stakeholder embargo.

**3.5.2.2 Disseminate/Publish Other Data Products [DPD 21-4.2.2]**

A detailed view of the activities that make up the “Disseminate/Publish Other Data Products” operational subactivity is given in Figure 31 below.

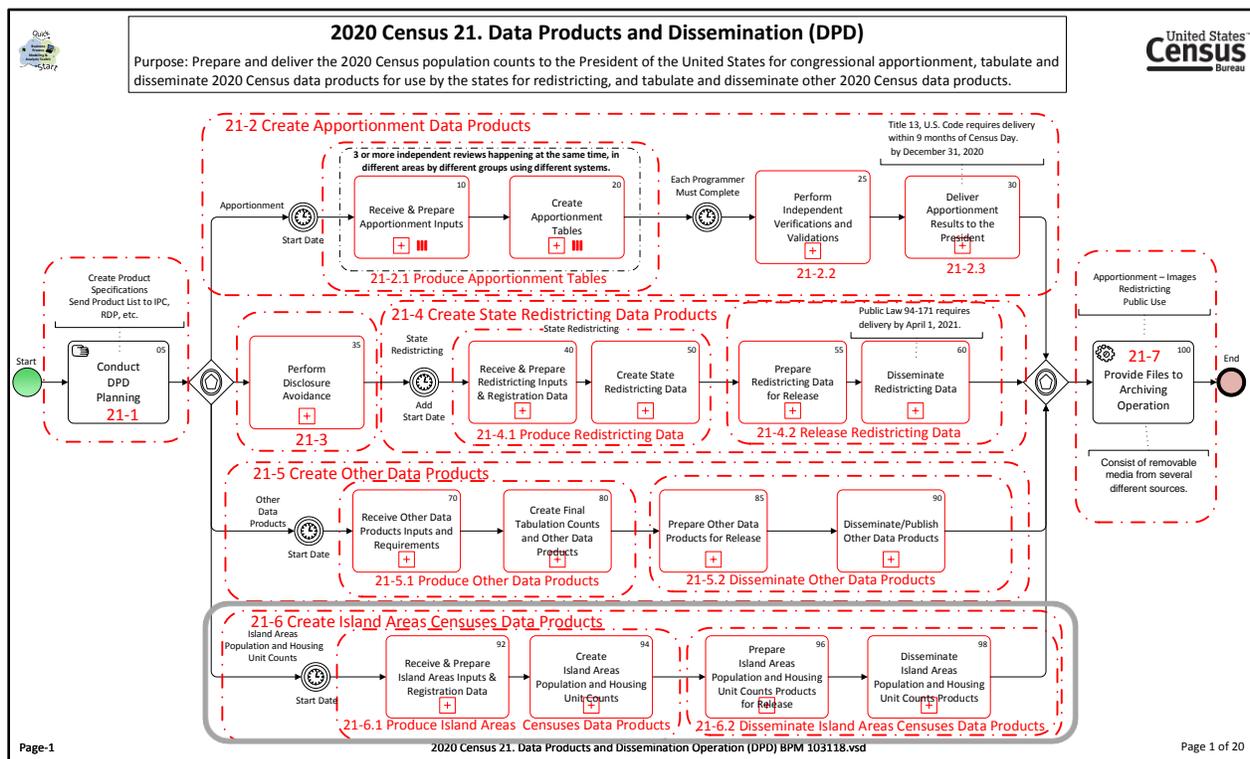


**Figure 31: Disseminate/Publish Other Data Products**

The media and other stakeholder embargo (for example, the State Data Centers and Census Information Centers) is the only embargo for the data sets of Demographic Profile, Summary File 1, and Summary File 2.

### 3.6 Create Island Areas Censuses Data Products [DPD 21-6]

Figure 32 shows the BPM for the Create Island Areas Censuses Data Products [DPD 21-5] activity area (area within the gray rounded rectangle) and its activities within the overall context of the DPD operation.



**Figure 32: Create Island Areas Censuses Data Products [DPD 21-6] Activities**

The Create Island Areas Censuses Data Products activity area is subdivided into the following operational subactivities:

- Create Island Areas Censuses Data Products [DPD 21-6].
  - Produce Island Areas Censuses Data Products [DPD 21-6.1].
  - Disseminate Island Areas Censuses Data Products [DPD 21-6.2].

All of the Island Areas Censuses data products are generated by the DPD for the Census Bureau and the IAC, which provides the data and confirms its delivery to each Area’s officials and legislative leaders with pertinent census population totals and other municipal or county-equivalent data.

Subsequent sections describe the Create Island Areas Censuses Data Products operational subactivities in detail.

### 3.6.1 Produce Island Areas Censuses Data Products [DPD 21-6.1]

The “Produce Island Areas Censuses Data Products” operational subactivity is subdivided into the following activities as described below:

- Produce Island Areas Censuses Data Products [DPD 21-6.1].

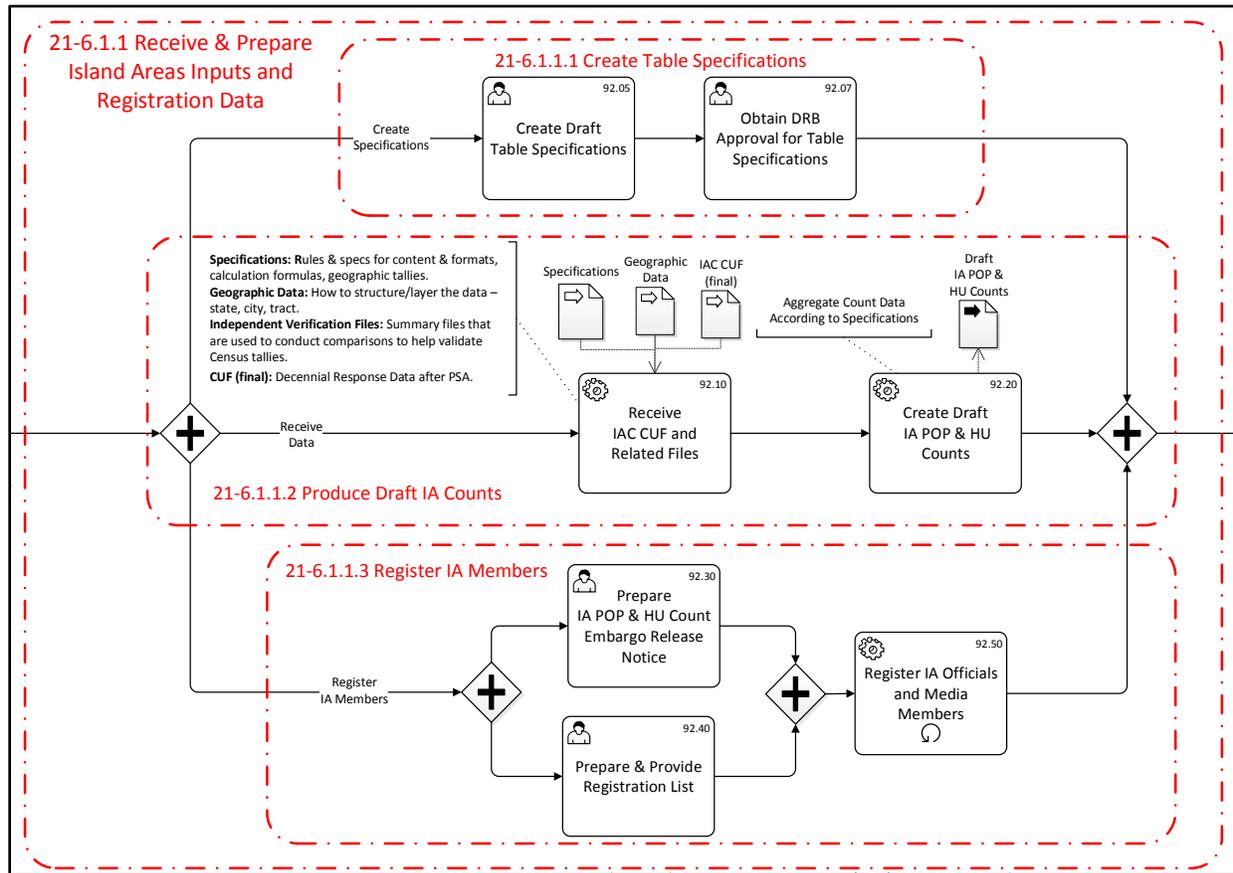
- Receive & Prepare Island Areas Inputs and Registration Data [DPD 21-6.1.1].
- Create Island Areas Population and Housing Unit Counts [DPD 21-6.1.2].

The Tabulation System is an enterprise solution that provides both the Island Areas Censuses tabulation processing and data product preparation and the 2020 Census data products. Input files for the initial product—the Island Areas Population and Housing Unit Counts—include geography metadata, the unedited demographic and housing counts, and the table specifications. The IAC requests that the Island Areas officials determine and provide the list of recipients for the data product when disseminated. DPD and the PIO also determine the list of media members for embargoed access to the data following the confirmation of the receipt of the data in each Island Area. The registration process is an input for the user-name restricted access for receipt and embargo.

Subsequent sections describe the Produce Island Areas Censuses Data Products operational subactivities in detail.

#### **3.6.1.1 Receive & Prepare Island Areas Inputs and Registration Data [DPD 21-6.1.1]**

A detailed view of the activities that make up the “Receive & Prepare Island Areas Inputs and Registration Data” operational subactivity is given in [Figure 33](#) below.



**Figure 33: Receive & Prepare Island Areas Inputs and Registration Data**

The “Receive & Prepare Island Areas Inputs and Registration Data” operational subactivity is subdivided into the following activities:

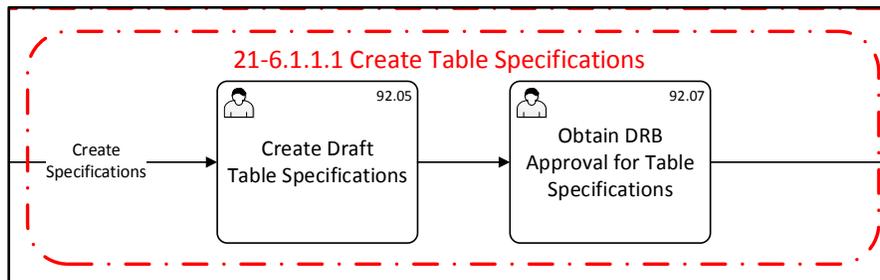
- Receive & Prepare Island Areas Inputs and Registration Data [DPD 21-6.1.1].
  - Create Table Specifications [DPD 21-6.1.1.1].
  - Produce Draft IA Counts [DPD 21-6.1.1.2].
  - Register IA Members [DPD 21-6.1.1.3].

The initial product contains population and housing counts for the Island Areas Censuses based on the Census Unedited File (CUF). The IAC designs the table shell and provides it to the Tabulation System for table generation.

Subsequent sections describe the Receive & Prepare Island Areas Inputs and Registration Data operational subactivities in detail.

**Create Table Specifications [DPD 21-6.1.1.1]**

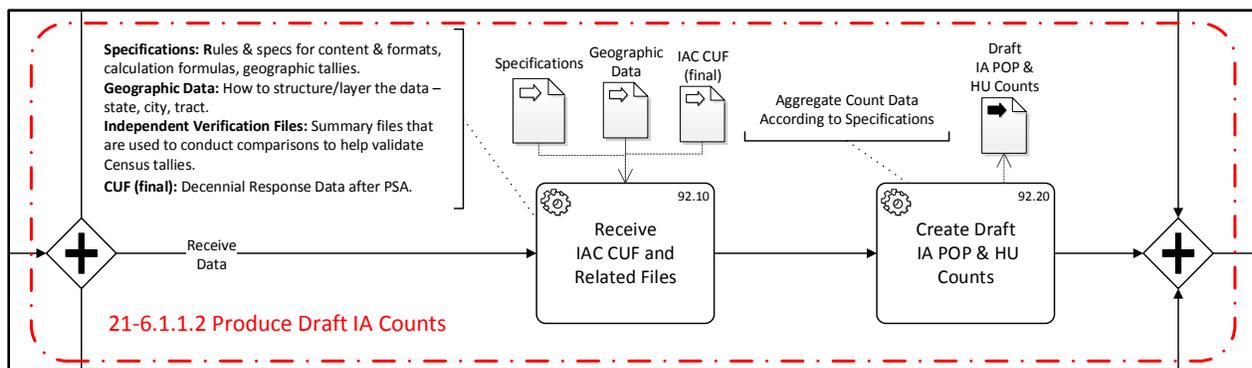
A detailed view of the activities that make up the “Create Table Specifications” operational subactivity is given in Figure 34 below.



**Figure 34: Create Table Specifications**

**Produce Draft IA Counts [DPD 21-6.1.1.2]**

A detailed view of the activities that make up the “Produce Draft IA Counts” operational subactivity is given in Figure 35 below.

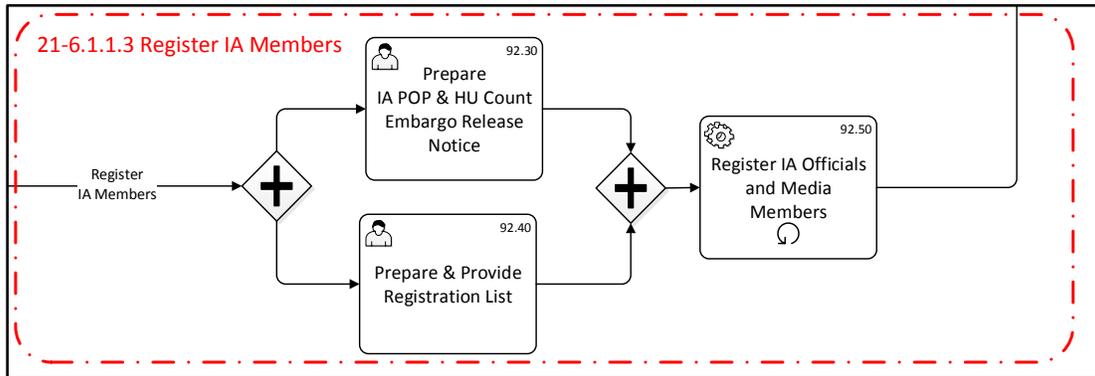


**Figure 35: Produce Draft IA Counts**

The Tabulation System aggregates the person and household records for the four Island Areas and includes GQ records for the 2020 Island Area Censuses Draft Counts. The IA-CUF is the baseline file for the total count of people and the total count of housings units. The final frame for GQ records is also included.

**Register IA Members [DPD 21-6.1.1.3]**

A detailed view of the activities that make up the “Register IA Members” operational subactivity is given in [Figure 36](#) below.

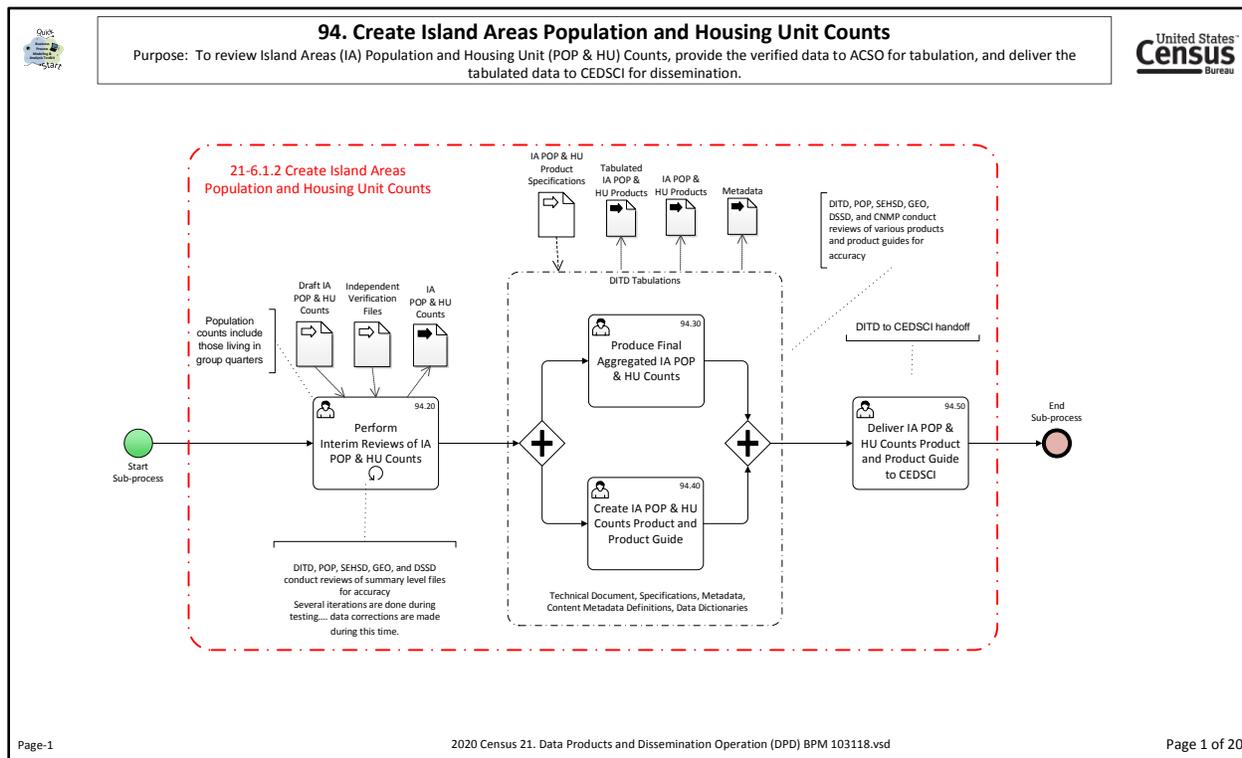


**Figure 36: Register IA Members**

The registration process is an input for the user-name restricted access for receipt and embargo.

**3.6.1.2 Create Island Areas Population and Housing Unit Counts [DPD 21-6.1.2]**

A detailed view of the activities that make up the “Create Island Areas Population and Housing Unit Counts” operational subactivity is given in [Figure 37](#) below.



**Figure 37: Create Island Areas Population and Housing Unit Counts**

The Tabulation System aggregated the data according to the table specifications, which includes the presentation of geographic hierarchies and metadata. The data summaries are reviewed by staff in POP and SEHSD, as well as peer reviewed in DITD after the initial aggregation of data described in Figure 35. The 2020 Census Tabulation staff also include attributes and metadata as required by CEDSCI for public dissemination through the Census Bureau data platform. The data is provided to CEDSCI according to the enterprise ICD.

### 3.6.2 Disseminate Island Areas Censuses Data Products [DPD 21-6.2]

The “Disseminate Island Areas Censuses Data Products” operational subactivity is subdivided into the following activities as described below:

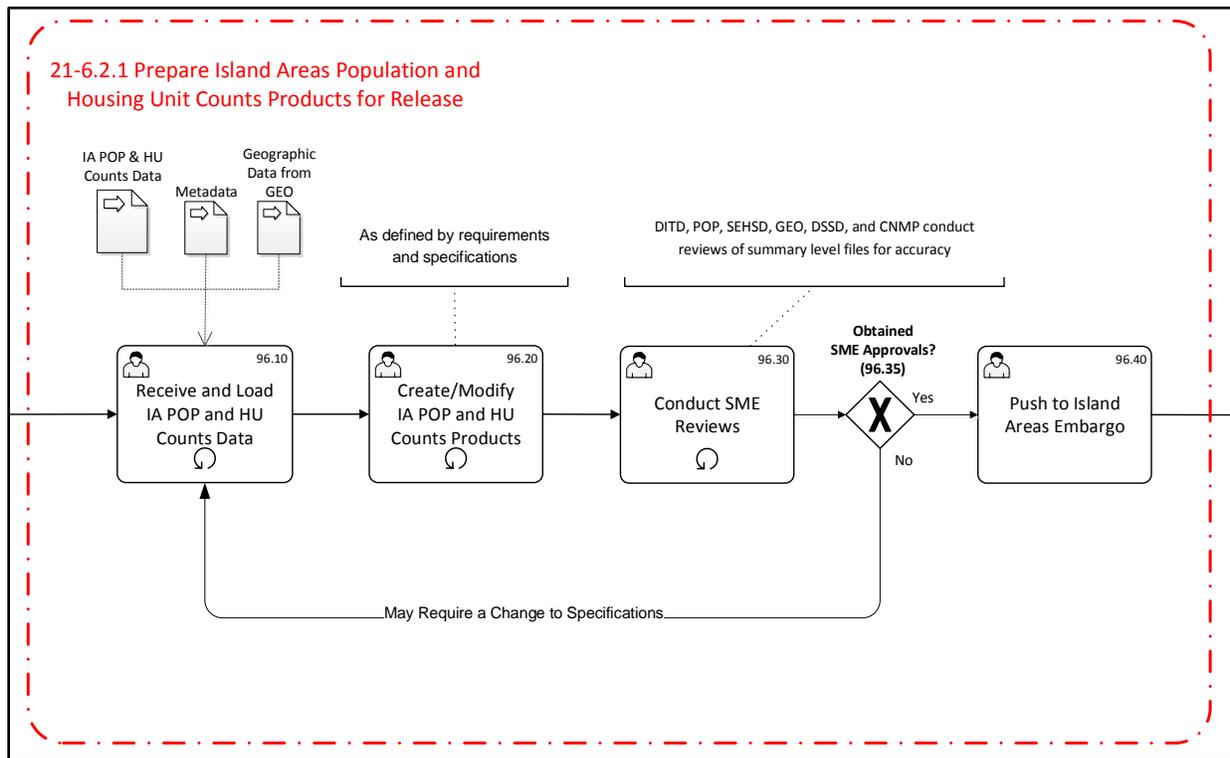
- Disseminate Island Areas Censuses Data Products [DPD 21-6.2].
  - Prepare Island Areas Population and Housing Unit Counts Products for Release [DPD 21-6.2.1].
  - Disseminate Island Areas Population and Housing Unit Counts Products [DPD 21-6.2.2].

The data are loaded and reviewed for their presentation (verify the metadata and table formatting). The sign-off process of approvals launches (pushes) the data to CEDSCI.

Subsequent sections describe the Disseminate Island Areas Censuses Data Products operational subactivities in detail.

### 3.6.2.1 Prepare Island Areas Population and Housing Unit Counts Products for Release [DPD 21-6.2.1]

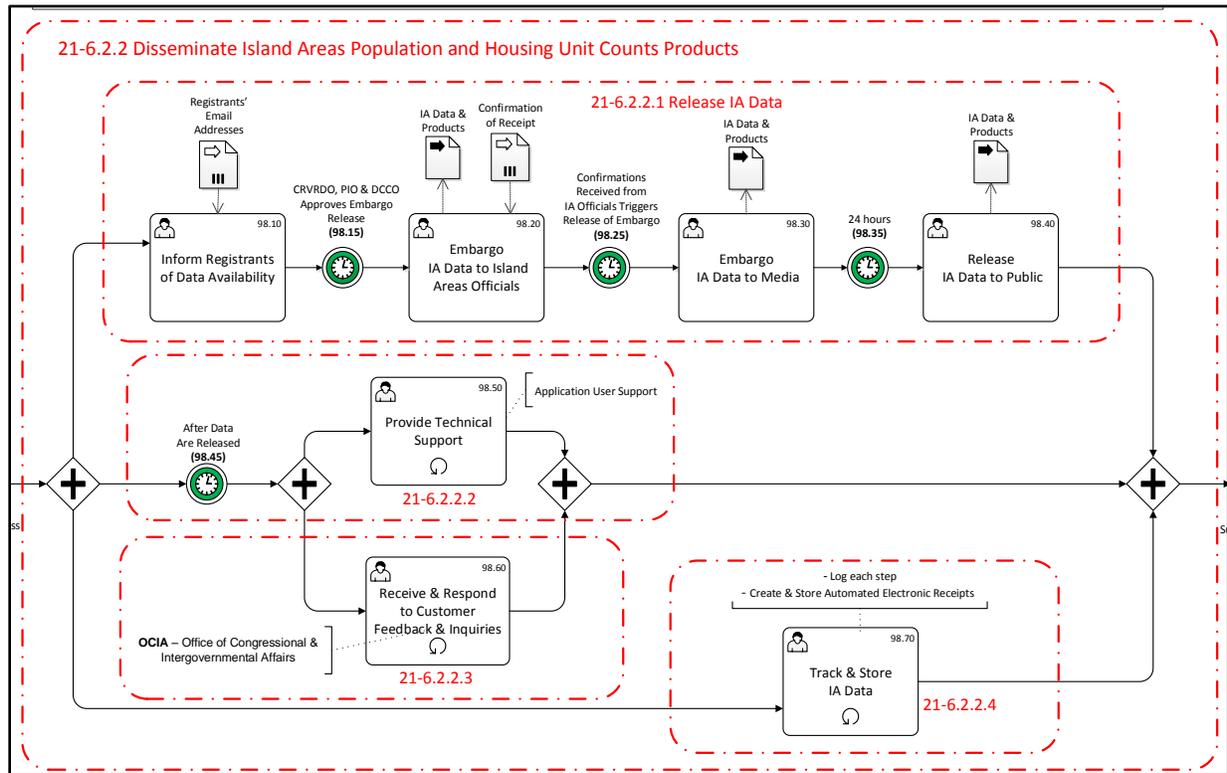
A detailed view of the activities that make up the “Prepare Island Areas Population and Housing Unit Counts Products for Release” operational subactivity is given in [Figure 38](#) below.



**Figure 38: Prepare Island Areas Population and Housing Unit Counts Products for Release**

### 3.6.2.2 Disseminate Island Areas Population and Housing Unit Counts Products [DPD 21-6.2.2]

A detailed view of the activities that make up the “Disseminate Island Areas Population and Housing Unit Counts Products” operational subactivity is given in [Figure 39](#) below.



**Figure 39: Disseminate Island Areas Population and Housing Unit Counts Products**

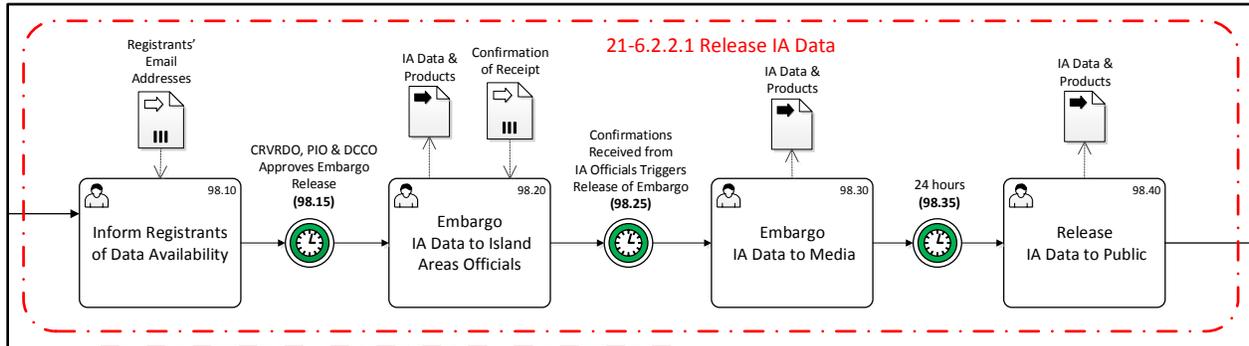
The “Disseminate Island Areas Population and Housing Unit Counts Products” operational subactivity is subdivided into the following activities:

- Disseminate Island Areas Population and Housing Unit Counts Products [DPD 21-6.2.2].
  - Release IA Data [DPD 21-6.2.2.1].
  - Provide Technical Support [DPD 21-6.2.2.2].
  - Receive & Respond to Customer Feedback and Inquiries [DPD 21-6.2.2.3].
  - Track & Store IA Data [DPD 21-6.2.2.4].

Subsequent sections describe the Disseminate Island Areas Population and Housing Unit Counts Products operational subactivities in detail.

***Release IA Data [DPD 21-6.2.2.1]***

A detailed view of the activities that make up the “Release IA Data” operational subactivity is given in [Figure 40](#) below.

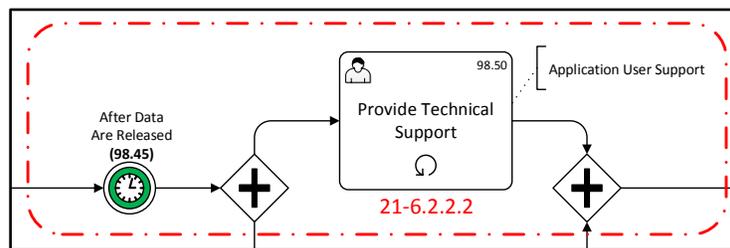


**Figure 40: Release IA Data**

The first embargo period is dedicated to the Island Area (designated) officials. The IAC manages the communication with the Island Areas liaisons and officials and with the DPD (for status within the Census Bureau leadership, DCCO, and the PIO). The IAC uses BOC systems and direct communication with the Island Area data recipients to confirm receipt which in turn prompts the trigger for the second embargo to the media. The release to the public follows the 24-hour media embargo.

***Provide Technical Support [DPD 21-6.2.2.2]***

A detailed view of the activities that make up the “Provide Technical Support” operational subactivity is given in [Figure 41](#) below.

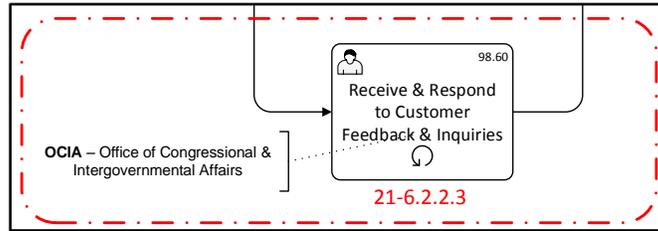


**Figure 41: Provide Technical Support**

The Census Bureau is working to minimize instances where technical (application support) is necessary, but this customer service component is included in the operational plan.

***Receive & Respond to Customer Feedback and Inquiries [DPD 21-6.2.2.3]***

A detailed view of the activities that make up the “Receive & Respond to Customer Feedback and Inquiries” operational subactivity is given in [Figure 42](#) below.

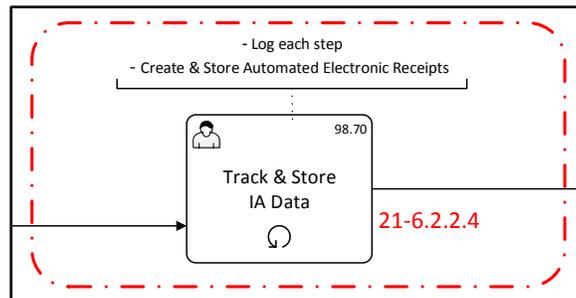


**Figure 42: Receive & Respond to Customer Feedback and Inquiries**

The Census Bureau works with the Island Areas and other data users to understand the data, implement data access and display tools, and work to resolve any enumeration anomalies.

***Track & Store IA Data [DPD 21-6.2.2.4]***

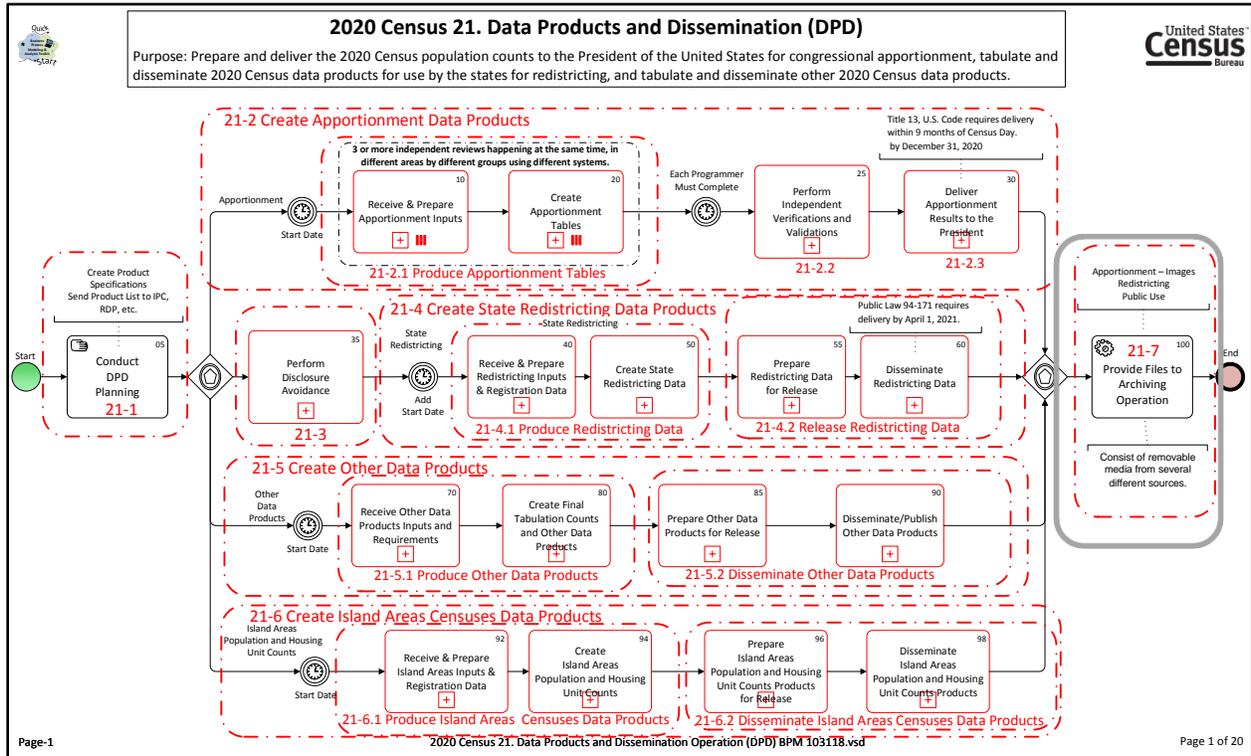
A detailed view of the activities that make up the “Track & Store IA Data” operational sub-activity is given in [Figure 43](#) below.



**Figure 43: Track & Store IA Data**

**3.7 Provide Files to Archiving Operation [DPD 21-7]**

[Figure 44](#) shows the BPM for the Provide Files to Archiving Operation [DPD 21-6] activity area (area within the gray rounded rectangle) and its activities within the overall context of the DPD operation.



**Figure 44: Provide Files to Archiving Operation [DPD 21-7] Activities**

The ARC operation manages the 2020 Census records management. The tangible datasets produced by DPD are located in the CDL until the ARC provides them to the National Archives and Records Administration (NARA).

## 4. Cost Factors

The investment in DPD is projected to have minimal influence on the 2020 Census overall costs and quality. While the DPD operation is not a major cost driver for the 2020 Census, the following mechanisms from the IDEF0 Context Diagram represent the resources used to support this operation and comprise part of the 2020 Census cost elements:

### Staff

- Headquarters (HQ) Staff.

### Sites

- HQ.

### Systems

- CEDSCI.
- TAB.
- DRPS: DAS.
- CDL.
- CPASS.

### Other

- HQ Office IT Infrastructure.
- Census Network

## 5. Measures of Success

For the 2020 Census operations, the corresponding Measures of Success will be documented in the operational assessment study plans and final reports. The operational assessment study plan documents the criteria that will be used to define successful completion of the operation. The operational assessment report will provide results on whether the criteria were met.

In general, operational assessments report on planned to actual variances in budget, schedules, and production and training workloads. The corresponding Measures of Success (as documented in the operational assessment study plan) include variances that exceed established thresholds. See *Preparing for the 2020 Census Operational Assessment Study Plan* for the potential scope of assessment.

Types of success measures include:

- **Process Measures** that indicate how well the process works, typically including measures related to completion dates, rates, and productivity rates.
- **Cost Measures** that drive the cost of the operation and comparisons of actual costs to planned budgets. Costs can include workload as well as different types of resource costs.
- **Measures of the Quality** of the results of the operation, typically including things such as rework rates, error rates, and coverage rates.

See the corresponding operational assessment study plan and report for the Data Products and Dissemination operation (DPD) for details on the measures of success.

## Appendix A – Acronyms and Terminology

Table 7 lists the acronyms and abbreviations used within this Detailed Operational Plan document.

Table 8 lists a Glossary of Terms used within this Detailed Operational Plan document.

**Table 7: Acronyms and Abbreviations List**

Acronym	Meaning
ACSO	American Community Survey Office
ARC	Archiving operation
BPM	Business Process Model
BPMN	Business Process Modeling Notation
CDL	Census Data Lake
CEDSCI	Center for Enterprise Dissemination Services and Consumer Innovation
CEF	Census Edited File
CPASS	Census Public Access Security System
CMDE	Coverage Measurement Design and Estimation Operation
CNMP	Center for New Media and Promotion
CQAS	Correspondence Quality Assurance Staff
CQR	Count Question Resolution operation
CRO	Count Review Operation
CRVDO	Census Redistricting and Voting Rights Data Office
CUF	Census Unedited File
DA	Disclosure Avoidance
DAS	Disclosure Avoidance System
DCCO	Decennial Communications Coordination Office
DCMD	Decennial Census Management Division
DITD	Decennial Information Technology Division
DOP	Detailed Operational Plan

Acronym	Meaning
DPD	Data Products and Dissemination operation
DPP	Data Products Production
DRPS	Decennial Response Processing System
DRPS: DAS	Decennial Response Processing System: Disclosure Avoidance System
DSEP	Data Stewardship Executive Policy Committee
DSSD	Decennial Statistical Studies Division
DTS	Decennial Translation Staff
EAE	Evaluation and Experiments operation
FACO	Federally Affiliated Count Overseas operation
GDP	Geographic Data Processing
GEO	Geography Division
GEOP	Geographic Programs operation
GQ	Group Quarters operation
GRF-C	Geographic Reference File-Codes
GRF-N	Geographic Reference File-Names
HH	Household
HQ	Headquarters
HU	Housing Unit
IA	Island Areas
IAC	Island Areas Censuses
ICD	Interface Control Document
IBM	International Business Machines Corporation
IDEF0	Integrated Definition, Level 0 model
IE	Information Exchange
IOD	Integrated Operations Diagram
IPC	Integrated Partnership and Communications operation
IPT	Integrated Project Team
IT	Information Technology

Acronym	Meaning
LQ	Living Quarters
MAF	Master Address File
MAFID	Master Address File Identifier
MISC	MAF Identifier State Change
MDF	Microdata Detail File
NARA	National Archives and Records Administration
NPC	National Processing Center
OCIA	Office of Congressional & Intergovernmental Affairs
PDC	Paper Data Capture operation
PES	Post-Enumeration Survey
PM	Program Management operation
POP	Population Division
PR	Puerto Rico
QA	Quality Assurance
QC	Quality Control
PIO	Public Information Office
RDP	Redistricting Data Program operation
RPO	Response Processing Operation
RPS	Response Processing System
SEHSD	Social, Economic and Housing Statistics Division
SME	Subject Matter Expert
SPC	Security, Privacy, and Confidentiality operation
TAB	Tabulation System
TIGER	Topologically Integrated Geographic Encoding and Referencing system
U.S.C.	United States Code
VTD	Voting District

**Table 8: Glossary of Terms**

<b>Term</b>	<b>Meaning</b>
Apportionment	Apportionment is the calculation of the number of seats in the House of Representatives that each state should receive based on the resident population and the counts of federally affiliated overseas.
Cross-tabulation	Data are aggregated and presented for several variables.
Disclosure	A disclosure would occur if someone could infer data values for a particular business, that has provided information through a census or sample survey form, under a pledge of confidentiality. The Census Bureau is sworn to protect confidentiality and privacy and we work to avoid disclosure of data.
Differential Privacy Protection	Modeling to introduce “formally private noise infusion”; the current approach to protect confidentiality of the responses to the 2020 Census
Dissemination	The release of data files or products that fulfills the Census Bureau mission to serve as the leading source of quality data about the nation's people and economy.
Embargo	A period of time and a secure, password-protected environment that is dedicated to the state (designated) officials for 24 hours that continues with a second embargo to the media. The release to the public follows the 24-hour media embargo.
Metadata	Metadata is simply data about data. It means it is a description and context of the data. It helps to organize, find and understand data. Examples are titles, descriptions, tags and categories.
Microdata	Microdata files are those that contain information on individuals rather than cross-tabulations. The U.S. Census Bureau's Summary Files contain aggregate data and consist of totals of individuals with various specified attributes in a particular geographic area. They are, in a sense, tables of totals. The Bureau's PUMS (Public Use Microdata Sample) files, however, contain the data from the original census survey instrument with certain information removed to protect the confidentiality of the respondent.

Term	Meaning
P.L. 94-171	Public Law 94-171 requires the Census Bureau to provide to each state’s governor and legislative leaders with pertinent census population totals for the state identified small area geography needed for conducting legislative redistricting. The P.L. 94-171 Redistricting Data must be provided to the states by April 1, 2021, one year from Census Day.
Redistricting	The legislatures in each state are responsible for geographically defining the boundaries of their congressional and other election districts—a process known as “redistricting.”
Tabulation	Tabulation is a process of summarizing data and presenting it in a compact form, by putting data into statistical table or a file organized with rows and columns.
Voting District	Voting district is the generic term for geographic entities such as precincts, wards, and election districts established by state and local governments.

## Appendix B – References

Appendix B lists the documents or other resources used during the development of this Detailed Operational Plan document.

U.S. Census Bureau, “[\*2020 Census Operational Plan\*](#),” Version 3.0, October 27, 2017.

U.S. Census Bureau, “Preparing for the 2020 Census Operational Assessments Study Plan,” Draft, May 10, 2018.

## Appendix C – Activity Tree for Data Products and Dissemination Operation (DPD)

This appendix presents the Activity Tree for the DPD operation. An Activity Tree uses an outline structure to reflect the decomposition of the major operational activities in the operation. Each activity is numbered according to its position in the outline. For example, for the current operation numbered “21,” the first activity would be numbered 21-1. Subactivities under this activity would be numbered sequentially, starting again with the number one. For example, the first subactivity under the first activity would be numbered 21-1.1 the second subactivity as 21-1.2. The second activity would be numbered 21-2, and so on.

### DPD Activity Tree:

- 21-1 Conduct DPD Planning
- 21-2 Create Apportionment Data Products
  - 21-2.1 Produce Apportionment Tables
    - 21-2.1.1 Receive & Prepare Apportionment Inputs
      - 21-2.1.1.1 Receive Apportionment Related Files
      - 21-2.1.1.2 Review and Verify Files
      - 21-2.1.1.3 Tally Person Counts by State from CUF
      - 21-2.1.1.4 Combine Final Resident Population File with FACO File (50 States)
    - 21-2.1.2 Create Apportionment Tables
  - 21-2.2 Perform Independent Verifications and Validations
  - 21-2.3 Deliver Apportionment Results to the President
- 21-3 Perform Disclosure Avoidance
- 21-4 Create State Redistricting Data Products
  - 21-4.1 Produce Redistricting Data
    - 21-4.1.1 Receive & Prepare Redistricting Inputs and Registration Data
      - 21-4.1.1.1 Create Initial Redistricting Data Products
      - 21-4.1.1.2 Register State & Media Members
    - 21-4.1.2 Create State Redistricting Data
  - 21-4.2 Release Redistricting Data
    - 21-4.2.1 Prepare Redistricting Data for Release
    - 21-4.2.2 Disseminate Redistricting Data
      - 21-4.2.2.1 Release Redistricting Data to Stakeholders
      - 21-4.2.2.2 Provide Technical Support
      - 21-4.2.2.3 Receive & Respond to Customer Feedback and Inquiries

- 21-4.2.2.4 Track & Store State Data
- 21-5 Create Other Data Products
  - 21-5.1 Produce Other Data Products
    - 21-5.1.1 Receive Other Data Products Inputs and Requirements
    - 21-5.1.2 Create Final Tabulation Counts and Other Data Products
  - 21-5.2 Disseminate Other Data Products
    - 21-5.2.1 Prepare Other Data Products for Release
    - 21-5.2.2 Disseminate/Publish Other Data Products
- 21-6 Create Island Areas Censuses Data Products
  - 21-6.1 Produce Island Areas Censuses Data Products
    - 21-6.1.1 Receive & Prepare Island Areas Inputs and Registration Data
      - 21-6.1.1.1 Create Table Specifications
      - 21-6.1.1.2 Produce Draft IA Counts
      - 21-6.1.1.3 Register IA Members
    - 21-6.1.2 Create Island Areas Population and Housing Unit Counts
  - 21-6.2 Disseminate Island Areas Censuses Data Products
    - 21-6.2.1 Prepare Island Areas Population and Housing Unit Counts Products for Release
    - 21-6.2.2 Disseminate Island Areas Population and Housing Unit Counts Products
      - 21-6.2.2.1 Release IA Data
      - 21-6.2.2.2 Provide Technical Support
      - 21-6.2.2.3 Receive & Respond to Customer Feedback and Inquiries
      - 21-6.2.2.4 Track & Store IA Data
- 21-7 Provide Files to Archiving Operation