

U.S. Census Bureau Research on Record Linkage and Entity Resolution

TABLE OF CONTENTS

- I. Funding Opportunity Description 3
 - A. Program Objective 3
 - B. Program Priorities 5
 - C. Program Authority 10
- II. Award Information 10
 - A. Funding Availability 10
 - B. Project/Award Period 11
 - C. Type of Funding Instrument 11
- III. Eligibility Information 12
 - A. Eligible Applicants 12
 - B. Cost Sharing or Matching Requirement 12
 - C. Other Criteria that Affect Eligibility 12
- IV. Application and Submission Information 13
 - A. Address to Request Application Package 13
 - B. Content and Form of Application 13
 - C. Unique Entity Identifier and System for Award Management (SAM) 17
 - D. Submission Dates and Times 18
 - E. Intergovernmental Review 18
 - F. Funding Restrictions 18
 - G. Other Submission Requirements 19
- V. Application Review Information 19
 - A. Evaluation Criteria 19
 - B. Review and Selection Process 22
 - C. Selection Factors 24
 - D. Anticipated Announcement and Award Dates 24
- VI. Award Administration Information 24
 - A. Award Notices 24
 - B. Administrative and National Policy Requirements 24
 - C. Reporting 25
- VII. Agency Contacts 27
- VIII. Other Information 28

NOTICE OF FUNDING OPPORTUNITY

EXECUTIVE SUMMARY

Federal Agency Name(s): US Census Bureau (CENSUS), Department of Commerce, Research and Methodology Directorate (RMD)

Funding Opportunity Title: U.S. Census Bureau Research on Record Linkage and Entity Resolution

Announcement Type: Initial

Funding Opportunity Number: CENSUS-RMD-RMDPO-2021-2006906

Catalog of Federal Domestic Assistance (CFDA) Number: 11.016, Statistical, Research, and Methodology Assistance

Dates: Full applications must be submitted and received through Grants.gov no later than 11:59 p.m. Eastern Daylight Time on (30 days after publication). No paper applications will be accepted. Applications received after this time will not be reviewed or considered. In the event of a confirmed systems issue, NOAA reserves the right to accept an application Notice of Federal Funding in an alternate [paper] format prior to the application deadline.

Funding Opportunity Description: The Census Bureau (BOC) is soliciting applications from eligible applicants to support research that improves measurement of the U.S. population and economy by identifying, evaluating, and assessing the options to expand the population coverage of a production system for record linkage and entity resolution, and to improve the quality of linkages. This includes procedures for application to populations of humans, households, businesses, and other entities.

There are two program priorities under this announcement: (1) Improvement of Methodology Related to Record Linkage, Entity Resolution and Evaluation Thereof; and (2) Development and Improvement of the Technology for Entity Resolution and Record Linkage. The two priorities should proceed simultaneously and do not require the recipient to perform both. Please refer to Section I. Program Description under this Notice of Funding Opportunity for more information regarding each priority.

FULL ANNOUNCEMENT TEXT

I. Funding Opportunity Description

A. Program Objective

This announcement is a mechanism to engage with the research community to encourage and promote methodological research, and technology development and improvement, intended to improve capabilities for entity resolution and record linkage. It is anticipated that these improved capabilities would lead to more accurate statistics on the U.S. population and economy and more meaningful measures of total uncertainty.

A. General Background

The public relies on data products and statistics about the U.S. population and economy produced using entity resolution and record-linkage methods for purposes such as Congressional apportionment, redistricting, distribution of public funds, entrepreneurs' decisions about where to locate their businesses, and monetary policy. Both expansion of methodological research, and further technology development and improvement, for entity resolution and record linkage are needed to facilitate greater use of administrative data in production of statistical information, reduction of survey respondent burden and reduction of related costs. In addition, explicitly incorporating linkage uncertainty into measures of total error will enable better quality inferences from blended estimators. These improvements would also benefit research conducted in Federal Statistical Research Data Centers by academic and government researchers; this research informs the public on important policy issues. The knowledge and technical capabilities gained from this effort can also be shared with other government agencies, as well as technical groups, academia, and private sector organizations facing similar entity resolution and record linkage challenges.

The following six example use cases illustrate the need for methodology research, and technology development and improvement in entity resolution and record linkage. They also provide some background explanation for the decision by the Census Bureau that currently available methodology and technology require substantial expansion to meet more fully the needs of statistical agencies, as well as statistical organizations in academia and the private sector. Consequently, these use cases may provide insights into Program Priorities 1 and 2 listed below, but the goals and scope for Program Priorities are not limited to addressing use cases (i) through (vi).

Use Case i: The Census Bureau's production person record linkage system links each incoming data source to a set of reference files to assign person identifiers (see Wagner and

Layne (2014) for a description). Records can then be merged across sources using those identifiers. Such a system obviates the need to relink billions of records every time a new dataset needs identifiers, saving time. One drawback of this system is that the reference files exclude most U.S. residents who lack a Social Security Number (SSN). Such people don't receive identifiers. How can the system be adapted to cover persons without SSNs, while maintaining reference files that allow data sources to be linked serially?

Use Case ii: In many applications, statistical organizations need to consider the linkage of more than two datasets; a given unit may be included in one, two or more than two of those datasets. However, most production record linkage systems do not account for this complex dataset structure. For example, the linkage between one dataset and the reference file may not incorporate information from other sources not part of the reference files that contain records that look like that person or business. Is there a way to conduct large-scale entity resolution that takes information from other databases into account, while still processing records fast enough to meet production needs?

Use Case iii: When linking 1940 Census and birth certificate data, Bailey et al. (2020) find that standardizing names increases recall, but it decreases precision by much more. They also find that using only links made by multiple record linkage techniques leads to a significant increase in precision, similar to levels achieved from hand matching. Can record linkage quality can be improved by revising how name and address standardization is used in the production record linkage process and/or by using only links made by multiple methods? Can name standardization be modified to better handle non-English names? Can address standardization treat non-city-style addresses more effectively?

Use Case iv: "Blocking" can greatly reduce processing time by limiting the number of comparisons made in the linkage process. Record linkage results can be quite sensitive to the "blocking" strategy used, however. How can the "blocking" strategy be optimized for both speed and quality?

Use Case v. Record linkage methods generally don't incorporate the fact that persons are members of a household, and establishments are parts of firms, treating each linkage independently of the others within the larger unit. This can lead to a record being linked to both the father and son when they have the same name, for example. Also, administrative data may establish that two children share the same parent(s). The linkage of one child to a record in a household could potentially aid in the linkage of the sibling to a record in the household. Can record linkage methodologies be modified to take group structure into account?

Use Case vi: Record linkage is often an input to substantive research, analyses, or reports. Traditional statistical approaches provide a means to discuss error and research limitations, but error introduced through record linkage is often unmeasured. In a production setting, how can record linkage quality and error be quantified and incorporated into downstream analytic products?

B. Program Priorities

There are two program priorities under this announcement: (1) Improvement of Methodology Related to Record Linkage, Entity Resolution and Evaluation Thereof; and (2) Development and Improvement of the Technology for Entity Resolution and Record Linkage.

Applicants may respond to one or both program priorities. Applicants must clearly indicate the program priorities to which they are applying to as listed below. Proposals not directly associated with these priorities will not be considered.

Priority 1: Improvement of Methodology Related to Record Linkage, Entity Resolution and Evaluation Thereof

The purpose of this funding opportunity for Priority 1 is to secure methodological research related to entity resolution and record linkage; and quantitative evaluation thereof, including total uncertainty measures, all in keeping with the “General Background” statement provided above.

Additional Background Specific to Priority 1:

Entity resolution and record linkage are umbrella terms for a collection of statistical techniques designed to determine whether records in one or more datasets represent the same underlying entity (e.g. a person, an establishment). Fellegi and Sunter (1969) laid the groundwork for much of the literature, with improvements through the years in comparisons of information contained in records (e.g. Winkler, 1990). A drawback of Fellegi-Sunter approaches, however, is that they treat record pairs as being independent, not accounting for transitivity or other record linkage structure constraints. Sadinle and Fienberg (2013) extend the Fellegi-Sunter approach to $k > 2$ files, but their methods break down for even moderately large k or complex datasets. Moreover, they provide little information about the uncertainty of the links relative to the (latent) true values of resolved entities. The Census Bureau seeks a methodology that can work for large k and complex datasets. Fortini et al. (2001) introduced a Bayesian version of Fellegi-Sunter, which allows the incorporation of constraints on the linkage (e.g., that a record from a dataset can be linked to at most one record from a second

dataset). Clustering-based approaches can integrate multiple databases, where duplicates may exist within and across the datasets – the most common context for the Census Bureau. Rather than linking record to record, the goal is to cluster records to their latent entity. Examples of the clustering approach include Monge and Elkan (1997), McVeigh et al. (2019), Tancredi and Liseo (2011), and Steorts et al. (2016). One drawback of the clustering approaches, however, is that they currently do not scale to large numbers of records and/or many component data tables. Some progress has been made on that front recently - Marchant et al. (2019) have developed software using distributed computing. But further advances are needed before the Census Bureau can use such a procedure in production. See Binette and Steorts (2020) for a review of the literature.

Another drawback of the literature to date is that some of the methods do not incorporate group structure, e.g., that people are nested within housing units, or establishments are nested within firms.

Currently, the Census Bureau uses multiple methodological approaches, but it is primarily reliant on variants of the Fellegi-Sunter algorithm for entity resolution of individual persons, which makes conditional independence assumptions which may not hold in all circumstances. Additionally, the Census Bureau has no single method for linking businesses or establishments at such a scale.

Record linkage will become more pivotal to the Census Bureau and the larger Federal Statistical System in the next decade, as attempts to blend administrative records and third-party data with survey responses increase, and non-survey data become more widely available. Current technologies and methods are unable to produce timely and accurate statistics to the extent desired. Crucially, any system must be able to devise new ways to describe the quality of matches, either when no known “ground-truth” data exist or when key assumptions (e.g. conditional independence for Fellegi-Sunter algorithms and some Bayesian algorithms) do not hold.

Project Description for Priority 1:

This program priority seeks research that will

- a) Produce theoretical results that show substantial improvements over current methodology for record linkage and entity resolution, especially in applications dominated by the issues summarized in the “Background” section.
- b) Produce practical diagnostics that can provide substantial improvements in the empirical assessment of the properties of the methodology considered in (a), with special emphasis on evaluation of the quality of linkage; the bias, variance and distributional properties of the resulting data products; and related sensitivity analyses.

c) Provide pilot software implementations of the methodology considered described in (a) and (b). The software for Objective 1 will be expected to be of high quality and well-documented, but due to its “pilot” nature, will not necessarily be required to meet all of the rigorous criteria required for the software produced for Objective 2. For example, this software need not link both persons and businesses in a production system, unlike the implementation called for in Objective 2.

Priority 2: Development and Improvement of the Technology for Entity Resolution and Record Linkage

The purpose of this funding opportunity is to improve the technology for entity resolution and record linkage through the development, implementation and testing of architecture and software systems that improve substantially over currently available systems. This improvement should go well beyond application of currently available technology. In particular, the resulting technology should be open-source, have thorough documentation consistent with strong industry standards, and be readily used and extensible by knowledgeable personnel of large-scale statistical organizations within the academia, private sector, state, and local government as well as the federal government. In the long run, we anticipate the majority of benefits of this technology will convey the above-mentioned sectors outside of the federal government. In addition, the technology product should be accompanied by a “sandbox” of multiple large-scale, public-domain datasets that would provide a basis for shared evaluation of methodology and technology in ways that are aligned with high-priority challenges frequently encountered in entity resolution and record linkage.

In addition, the technology product should be accompanied by a “sandbox” of multiple large-scale public-domain datasets that would provide a basis for shared evaluation of methodology and technology in ways that are aligned with high-priority challenges frequently encountered in entity resolution and record linkage.

Background Specific to Priority 2:

The Person Identification Validation System (PVS) is the Census Bureau’s production record linkage system for persons. It consists of a series of SAS programs that establish probabilistic linkage where source data are matched against a reference file based on the Social Security Administration Numident file enhanced with other federal administrative records. The process validates the source record and, if validated, assigns a unique, anonymized link key to the record. The Census Bureau has multiple other technological packages available for record linkage, including both internally (BigMatch) as well as

externally produced ones (e.g. d-blink and fastLink). However, no single software package meets all of Census Bureau's need for a flexible and scalable linkage technology useable in all cases. In terms of flexibility, the Census Bureau has access to many bespoke tools designed to match individual persons using information such as name and date of birth, but lacks a curated, integrated system that can link records regardless of the input. For example, the PVS system cannot match businesses or addresses; nor can it resolve entities across more than two files, without major modifications. Having a single integrated system capable of resolving entities like persons, households, businesses, and establishments via control language would enable the Census Bureau to easily incorporate new data into its public statistics in a timely manner. In terms of scalability, the Census Bureau needs a system able to match billions of records simultaneously. Given the scale of the data required by the Census Bureau, any solution architecture must be capable of operating on a single instance as well as across multiple servers without impacting the quality of the statistical output.

Like other record linkage researchers and large organizations, the Census Bureau seeks to develop large test datasets representative of the data it regularly links. Synthetic datasets previously used for entity resolution testing have been found to be relatively "clean" and fail to clearly distinguish some important quality features of competing entity resolution software. Murray (2020), for example, criticizes the overuse of "toy" datasets that may be unrepresentative of real-world applications. To some extent, the limitation in synthetic data derives from the complexity, or lack thereof, of the data imputes into the generation program. Bailey, et al. (2020) discuss examples of large-scale datasets in the public domain used for entity resolution testing, such as historical census data. An important component of the work will be to identify or create test datasets that are more representative of the challenging record linkage scenarios encountered in Census Bureau production.

Project Description for Priority 2:

This program priority seeks the development and implementation of algorithms, architecture and systems that will

- a) Over the course of no more than five years produce a sequence of software products that progress from proof-of-concept, through pilot, and on to fully robust production systems that constitute major advances in the technical areas identified in the "Background" section above. This development sequence should also include in-depth iterative testing as well as simultaneous development and evaluation of related documentation and support materials.

- b) Be fully open-source, have thorough documentation consistent with strong industry standards (NIST 2018), and should be readily used and extended by knowledgeable personnel of large-scale statistical organizations within the federal government, academia

and the private sector.

c) Be accompanied by a “sandbox” of multiple large-scale, public-domain datasets that would provide a basis for shared evaluation of methodology and technology in ways that are aligned with high-priority challenges frequently encountered in entity resolution and record linkage. All of the data for this “sandbox” should be entirely within the public domain, not subject to any confidentiality or intellectual-property constraints.

References

Bailey, M. J., C. Cole, M. Henderson, and C. Massey, 2020, “How Well Do Automated Linking Methods Perform? Lessons from US Historical Data,” *Journal of Economic Literature*, 58(4):997-1044.

Binette, O., and R. C. Steorts, 2020, “(Almost) All of Entity Resolution,” arXiv e-prints. ArXiv:2008.04443.

Fellegi, I. P., and A. B. Sunter, 1969, “A Theory for Record Linkage,” *Journal of the American Statistical Association*, 64(328):1183-1210.

Fortini, M., B. Liseo, A. Nuccitelli, and M. Scanu, 2001, “On Bayesian Record Linkage,” *Research in Official Statistics*, 4(1):185-198.

Marchant, N. G., R. C. Steorts, A. Kaplan, B. I. P. Rubinstein, and D. N. Elazar, 2019, “d-blink: Distributed End-to-End Bayesian Entity Resolution,” arXiv e-prints. ArXiv:1909.06039.

McVeigh, B. S., B. T. Spahn, and J. S. Murray, 2019, “Scaling Bayesian Probabilistic Record Linkage with Post-Hoc Blocking: An Application to the California Great Registers,” arXiv e-prints. ArXiv:1905.05337.

Monge, A. E., and C. P. Elkan, 1997, “An Efficient Domain-Independent Algorithm for Detecting Approximately Duplicate Database Records,” *Proceedings of the SIGMOD 1997 Workshop on Research Issues on Data Mining and Knowledge Discovery*, 23-29.

Murray, J. S., 2020, “A Unified Framework for De-Duplication and Population Size Estimation (Invited Discussion),” *Bayesian Analysis*, 15(2):664-669.

National Institute of Standards and Technology, 2018, Open Source Code, NIST S 6106.01,

available at

https://www.nist.gov/system/files/documents/2019/02/19/final_s_6106.01_ver_1.pdf
(accessed March 11, 2021).

Sadinle, M., and S. E. Fienberg, 2013, "A Generalized Fellegi-Sunter Framework for Multiple Record Linkage With Application to Homicide Record Systems," *Journal of the American Statistical Association*, 108(502):385-397.

Steorts, R. C., R. Hall, and S. E. Fienberg, 2016, "A Bayesian Approach to Graphical Record Linkage and Deduplication," *Journal of the American Statistical Association*, 111(516):1660-1672.

Tancredi, A. and B. Liseo, 2011, "A Hierarchical Bayesian Approach to Record Linkage and Size Population Problems," *Annals of Applied Statistics*, 5(2B):1553-1585.

Wagner, D., and M. Layne, 2014, "The Person Identification Validation System (PVS): Applying the Center for Administrative Record Research and Applications' (CARRA) Record Linkage Software," CARRA Working Paper #2014-01.

Winkler, W. E. 1990, "String Comparator Metrics and Enhanced Decision Rules in the Fellegi-Sunter Model of Record Linkage," *Proceedings of the Section on Survey Research Methods, American Statistical Association*, 354-359 (available at http://www.asasrms.org/Proceedings/papers/1990_056.pdf).

C. Program Authority

Consolidated Appropriations Act of 2021, Public Law 116-260, Section 110 states: Amounts provided by this Act or by any prior appropriations Act that remain available for obligation, for necessary expenses of the programs of the Economics and Statistics Administration of the Department of Commerce, including amounts provided for programs of the Bureau of Economic Analysis and the Bureau of the Census, shall be available for expenses of cooperative agreements with appropriate entities, including any Federal, State, or local governmental unit, or institution of higher education, to aid and promote statistical, research, and methodology activities which further the purposes for which such amounts have been made available.

II. Award Information

A. Funding Availability

The total funding amount available under this announcement for Priority 1 is estimated to be approximately \$250,000 for the initial year for multi-year award project(s) that are not to exceed five (5) years for the project life cycle. The total funding amount available under this announcement for Priority 1 under the full five (5) year project life cycle is estimated to be no more than \$1,000,000.

The total funding amount available under this announcement for Priority 2 is estimated to be approximately \$800,000 for the initial year for multi-year award project(s) that are not to exceed five (5) years for the project life cycle. The total funding amount available under this announcement for Priority 2 under the full five (5) year project life cycle is estimated to be no more than \$5,000,000.

When an application for a multi-year award is approved, funding will usually be made available to recipients for the first year of the program, and incrementally thereafter. If a proposal is selected for funding, the government has no obligation to provide any additional funding in connection with that award beyond that which is initially obligated/awarded to the recipient. Any continued support and funding will be contingent upon satisfactory performance, continued relevance to the priorities of the government, and the availability of funding.

In no event will BOC or the Department of Commerce be responsible for application preparation costs if programs fail to receive funding or are cancelled because of other agency priorities. Publication of this announcement does not obligate BOC to award any specific project or to obligate any available funds.

There is no guarantee that sufficient funds will be available to make awards for all top-ranked applications. The number of awards to be made as a result of this solicitation will depend on the number of eligible applications received, the amount of funds requested for projects, and the merit and ranking of the applications.

B. Project/Award Period

This announcement is for multi-year project(s) not to exceed a five-year period with an anticipated start date of September 1, 2021 unless otherwise directed. September 1, 2021 should be indicated as the project start date in the proposal. Note: The award must start on the first day of a month in the year, and end on the last day of a month in the year (i.e. 9/1/2021 – 8/31/2022).

C. Type of Funding Instrument

The funding instrument for these awards will be a Cooperative Agreement. It is expected

that there will be substantial involvement by BOC in the project activities. Substantial involvement includes close collaboration reviewing and analyzing project activities and frequent contact with the Recipient to help solve technical problems/situations as they arise during performance of the award and tracking progress towards the successful completion of the project.

III. Eligibility Information

A. Eligible Applicants

Eligible applicants are institutions of higher education and non-profit organizations. Applications from individuals, federal agencies, employees of federal agencies, for-profit organizations, and state, local, and Indian tribal governments will not be considered.

Any applicant that identifies as a federal government employee or federal contractor listed as a PI, co-PI, co-I, or a collaborator on the title page of a proposal will be deemed ineligible.

Note that if awarded the cooperative agreement, the Recipient's PI and other key team members identified on the project team must have currently or be able to obtain Census Bureau Special Sworn Status (SSS). Any individuals requiring access to Title 13 data must obtain SSS pursuant to 13 U.S.C. §23(c). These SSS will need to work with government data in the Census Bureau's Information Technology (IT) environment as testing and solutions developed outside of the Census Bureau IT environment may not be fully applicable to the Census Bureau's use cases.

B. Cost Sharing or Matching Requirement

Cost Sharing is not required.

C. Other Criteria that Affect Eligibility

Applicants will be ineligible for award if all requirements of this announcement and any amendments are not met as identified.

Funds will not be awarded to any applicant that is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal debarment or agency, or are presently indicted for or otherwise criminally or civilly charged by a government entity.

All non-Federal entities must comply with the Uniform Guidance requirements of Self-Reporting in accordance with 2 CFR § 200.112 "Conflict of Interest", Appendix XII and 2

CFR § 200.331 “Subrecipients Monitoring Requirements”.

Any organization or individual that is indebted to the United States and has a judgment lien filed against it for a debt to the United States, is ineligible to receive a Federal grant. Applicants are required to indicate in their applications if they are delinquent on any Federal debt. By signing the SF-424, the applicant is certifying that they are not delinquent on federal debt in accordance with OMB Circular A-129. (Examples of relevant debt include delinquent payroll or other taxes, audit disallowances, guaranteed and direct student loans, benefits that were overpaid, etc.).

Collaboration with PIs at different universities is allowed, but there must be a single application from a lead university with sub awards to the participants from other institutions. Other arrangements will not be considered. Proposals should clearly state the role of each PI in the proposal. While an eligible organization may submit more than one application, the Selecting Official may require that proposals be combined to increase the cost-benefit to the public. Only one proposal per principal investigator at a given institution may be funded.

IV. Application and Submission Information

A. Address to Request Application Package

The standard application package is available at <http://www.grants.gov> and can be searched for by using Funding Opportunity Number CENSUS-RMD-RMDPO-2021-2006906. Grants.gov requires applicants to register prior to submitting an application. Applicants must also register with System for Award Management (SAM). These registration processes can take several weeks and involve multiple steps. In order to allow sufficient time for these processes, applicants should register as soon as they decide to apply even if they are not ready to submit their proposal. Please do not register as a “Private” entity.

B. Content and Form of Application

a. Format Requirements

- (i) All pages should be in English, single-spaced with one-inch margins, and composed in an easy to read font (Times New Roman 12-point font, or an equivalent size, minimum). Smaller type may be used in figures and tables but must be clearly legible.
- (ii) Paper size is 8½” inches x 11” inches
- (iii) The project description may not exceed 15 pages, exclusive of title page, project synopsis, literature cited, budget information, resumes of investigators and key personnel,

and letters of support (if any). Project descriptions exceeding the 15-page limit will only be reviewed up to the page limit. Excess material will not be reviewed and may result in the proposal receiving a lower score.

(iv) The proposal must be submitted as a PDF file. Any PDF or other attachments that are included in an electronic application must meet the above format requirement when printed out.

(v) Paper, E-mail and Facsimile (fax) Submissions will not be accepted.

(vi) Failure to follow the requirements will result in the rejection of the application and its subsequent return.

b. Content Requirements

The following information must be included. Failure to submit it will result in an application not being reviewed.

i. Signed Title Page: The title page must be officially authorized by the institutional representative. All PIs and institutionalize representative(s) should be identified by full name, title, organization, telephone number, email address, and mailing address. The title page should clearly indicate which program priority area(s) are being addressed. The Application for Federal Assistance (SF-424) must be signed by the Authorized Representative. Electronic signatures submitted through grants.gov satisfy this requirement.

ii. Project Synopsis (1-page limit and single sided): It is critical that the project synopsis accurately describes the project being proposed and conveys all essential elements of the activities. It is imperative that potential applicants tie their proposals to the program priorities described in Section 1.B.2. (Program Priorities) of this announcement. The Project Synopsis must be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects).

iii. Project Description (15-page limit): The applicant should describe and justify the project being proposed and address each of the evaluation criteria as described below in Section E.1. (Application Review Information). Project descriptions should include clear objectives and specific approaches to achieving those objectives, including proposed methodology with a testing and evaluation approach to be employed, metric(s) for success, year-by-year timeline schedule of proposed key milestones, expected outcomes and benefits, personnel working on the project and their qualifications, and a description of the applicant's access to the necessary resources to accomplish the proposed objectives.

iv. Literature Cites: If applicable

v. Assurances: The SF-424B must be completed and submitted for all non-construction applications.

vi. Certification regarding debarment, suspension and other responsibility matters; and drug free workplace requirements. Additionally, the applicant must complete the Form CD-511, Certification Regarding Lobbying.

vii. Curriculum Vitae (CV) – A CV is required for Key Personnel; Principal Investigator(s), co-PIs, and Co-Is (3 pages maximum for each major participant). The CV should include a reference list of all publications and conference presentation relevant to the proposed work within at least the last three years. CV are not required for collaborator partners.

viii. Standard Application Forms: Please refer to the application package available through Grants.gov. Ensure the correct OMB prescribed standard forms are being requested as applicable:

- Standard Form 424 – Application for Federal Assistance
- Standard Form 424A – Budget Information – Non-Construction Programs –

When applying for a Multi-Year award (2 to 5 years), the non-federal entity must submit a line item budget (SF-424A) and corresponding budget narrative for each of the funding periods anticipated.

- Standard Form 424B – Assurances – Non-Construction Programs
- Standard Form LLL – Disclosure of Lobbying Activities
- Form CD-511 – Certification Regarding Lobbying

ix. SF-LLL, Disclosure of Lobbying Activities: (if applicable)

x. Data Sharing Plan (2-page limit):

Research data and information, collected and/or created under BOC cooperative agreements must be made visible, accessible, and independently understandable to general users, free of charge or at minimal cost, in a timely manner (typically no later than two (2) years after the data/information are created), except where limited by law, regulation, policy or by security requirements.

Unless otherwise noted in this federal funding announcement, a Data/Information Sharing

Plan of no more than two pages shall be required as an appendix. A typical plan may include the types of data and information to be created during the course of the project; the tentative date by which data will be shared; the standards to be used for data/metadata format and content; policies addressing data stewardship and preservation; procedures for providing access, data, and security; and prior experience in publishing such data. The Data/Information Sharing Plan will be reviewed as part of the BOC Standard Evaluation Criteria, Item 1 – Importance and/or Relevance and applicability of proposed project to the mission goals.

The Data/Information Sharing Plan (and any subsequent revisions or updates) will be made publicly available at time of award and, thereafter, will be posted with the published documentation about the project.

Failing to share data and information in accordance with the submitted Data/Information Sharing Plan may lead to disallowed costs and be considered by BOC when making future award decisions. Additionally, Principal Investigators must indicate how and when they have made their data accessible and usable by the community in the past. Information on BOC's Data Management Policy is available under:

Statistical Quality Standards

<https://www.census.gov/about/policies/quality/standards.html>

E-2 Reporting Results

F-1 Releasing Information Products

F-2 Providing Documentation to Support Transparency in Information Products

Department Administrative Orders (DAOs)

DAO 219-1 Publications -

http://www.osec.doc.gov/opog/dmp/daos/dao219_1.html

DAO 205-1 Records -

https://www.osec.doc.gov/opog/dmp/daos/dao205_1.html

DAO 205-12 FOIA

http://www.osec.doc.gov/opog/dmp/daos/dao205_12.html

xii. Budget and Budget Justification:

The SF-424A must be completed, and there should be a detailed budget justification accompanying the SF-424 budget forms (SF-424A non- construction programs) as

appropriate. Justifications should be provided for all budget items in sufficient detail to enable the reviewers to evaluate the appropriateness of the funding requested. Proposed funding levels must be consistent with the project scope, and only allowable costs must be included in the budget. Information on allowable costs is available in 2 CFR § 200 Subpart E – “Cost Principles”.

The budget justification should be broken out and detailed using the same budget categories as the SF- 424 budget form (SF-424A), such as personnel, fringe benefits, equipment, travel, supplies, contracts/sub awards, other direct costs, and indirect costs for which federal funds are requested for all project period years.

Please pay careful attention to show yearly budget breakout on the SF424A for multi-year proposals. The budget narrative must be consistent with the budget table and must be broken out and detailed using the same budget categories as the SF-424A budget form.

Please see Appendix A: “NOAA Grants Management Division’s Budget Narrative Guidance” for guidance on how to create a budget narrative.

xiii. Indirect Cost Rate Agreement:

Applicants requesting indirect cost are required to submit a copy of their current and signed indirect cost rate agreement.

C. Unique Entity Identifier and System for Award Management (SAM)

To enable the use of a universal identifier and to enhance the quality of information available to the public as required by the Federal Funding Accountability and Transparency Act, 31 U.S.C. 6101 note, to the extent applicable, and proposed awarded in response to this announcement will be required to use the System for Award Management (SAM), which may be accessed online at <https://www.sam.gov/SAM/>. Applicants are also required to use the unique entity identifier, as identified in OMB guidance published at 2 CFR Parts 25, which may be accessed at https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title02/2cfr25_main_02.tpl.

Applicants should allow a minimum of five days to complete the SAM registration. Registration is required only once but must be renewed periodically. Each applicant is required to:

- (i) Be registered in SAM before submitting its application;
- (ii) Provide a valid unique entity identifier in its application; and

(iii) Continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application under consideration by the operating unit or another Federal agency.

The federal awarding agency may not make a Federal award to an applicant until the applicant has complied with all applicable unique entity identifier and SAM requirements. If an applicant has not fully complied with the requirements by the time the federal awarding agency is ready to make an award, the operating unit may determine that the applicant is not qualified to receive an award and use that determination as a basis for making an award to another applicant.

D. Submission Dates and Times

Applications must be received by www.grants.gov by 11:59:59 p.m. Eastern Daylight Time on (30 days after publication) unless directed otherwise through a change to this announcement on Grants.gov. Applications received after this time will not be reviewed or considered for funding. No facsimile or electronic mail applications will be accepted.

E. Intergovernmental Review

Applications submitted under the NOFO are subject to the provisions of Executive Order 12372, "Intergovernmental Review of Federal Programs."

F. Funding Restrictions

Pre-award costs are allowable. However, pre-award costs are at the applicant's own risk if an award is not made. Permission to extend the period of performance beyond that stated in award documentation should be requested in writing at least 30 days in advance of an award's expiration date, as stated in the terms and conditions.

Applicants requesting indirect cost are required to submit a copy of their current and signed indirect cost rate agreement with the application package.

If an applicant does not have a current Facilities and Administrative Indirect Cost Rate Agreement that was negotiated and approved by the Department of Commerce (or by the applicable cognizant Federal agency), please provide a statement to this effect. The applicant must prepare and submit a cost allocation plan and rate proposal or a negotiated indirect cost rate as required by 2 CFR Part 200 "Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards." See 2 CFR § 200.414. The allocation plan and the rate proposal must be submitted to Census (or applicable cognizant Federal agency)

within ninety (90) days from the award start date. Alternatively, in accordance with 2 CFR § 200.414(f), any non-Federal entity that does not have a current negotiated (including provisional) rate, except for those non-Federal entities described in appendix VII to this part, paragraph D.1.b, may elect to charge a de minimis rate of 10% of modified total direct costs (MTDC) which may be used indefinitely. No documentation is required to justify the 10% de minimis indirect cost rate. Applicants proposing a 10 percent de minimis rate pursuant to 2 C.F.R. § 200.414(f) should note this election as part of the budget and budget narrative portion of the application. Indirect costs proposed under the award must be clearly identified as a separate budget line item.

The contact for information on indirect cost rates and establishing a new rate through the Department of Commerce is:

Stacy Tedder, Grants Officer
NOAA Grants Management Division 1325 East West Highway, 9th Floor
Silver Spring, Maryland 20910
stacy.a.tedder@noaa.gov

G. Other Submission Requirements

Applications are to be submitted via www.grants.gov. Users of Grants.gov will be able to download a copy of the application package, complete it offline, and then upload and submit the application via the Grants.gov site. If an applicant has problems downloading the application forms from Grants.gov, contact Grants.gov Customer Support at 240-533-9533 or <https://www.grants.gov/support.html>.

PLEASE NOTE: It may take Grants.gov up to two business days to validate or reject the application. Please keep this in mind in developing your submission timeline. Applicants should allow themselves sufficient time to submit their application to Grants.gov in advance of the deadline to ensure applications have been submitted successfully, as waivers of the submission deadline will not be granted. Late applications will not be accepted.

V. Application Review Information

A. Evaluation Criteria

A. Evaluation Criteria

Applicants are required to address in their proposal the criteria described in this section,

which serves as the fundamental basis for reviewing and ranking of the proposals. BOC has standardized evaluation criteria for all competitive assistance announcements. Separate evaluations and award decisions will be carried out for proposals submitted for Priority 1 and Priority 2, respectively. Applicants responsive to this announcement will be evaluated by reviewers for each program priority in determining their technical merit and base their recommendations regarding each proposal upon the extent to which the following criteria are satisfied:

Evaluation Criteria for Proposals Submitted Under Priority 1: Improvement of Methodology Related to Record Linkage, Entity Resolution and Evaluation Thereof

a. Criterion 1 – Intellectual Merit (30%):

The Intellectual Merit criterion encompasses the potential to develop substantially improved methodology for record linkage and entity resolution, especially within the context of challenges emphasized in the “background” section for Priority 1; the potential to provide a realistic methodological basis for improved quality diagnostics; and the potential to produce software implementations of the proposed methodology that would support practical evaluation and feasibility testing. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the application address the approach/soundness of design: i.e., are the conceptual framework, design, methods, and analyses suited to the project goals and objectives? Have potential issues and challenges been identified along with mitigation strategies? Does the plan incorporate a mechanism to assess success? What performance metrics will be used to monitor, measure, and evaluate the success or failure of the project?

b. Criterion 2 – Broader Impacts (30%):

The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes, as aligned with the content of this NOFO. To what extent are the proposed solutions (as proposed for parts (a)-(c) in the ‘Project Description’ under Section I.B. for priority 1) portable to other government agencies and organizations outside government that engage in record linkage and entity resolution? Does the project employ novel concepts, approaches or methods? Does the project develop new technologies? Does the project develop a system requiring minimal alterations to perform entity resolution for different use cases? To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts? A potentially transformative project is defined as something that has the potential to move the field forward in a substantial way (i.e., a game--changer).

c. Criterion 3 – Overall Qualifications of Applicants (20%):

How well qualified (as indicated by relevant training, experience, and record of productivity in applicable technical areas) is the individual, team, or organization to conduct the proposed activities? Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

d. Criterion 4 - Project Costs (20%):

This Project Cost criterion evaluates the budget to determine if it is realistic and commensurate with the project needs and timeframe. Does the proposed budget include sufficient details, with appropriate breakdown and justification of costs by object class? Is the proposed budget cost-effective and realistic based on the applicant's stated objectives, technical approach, and time frame? Does the budget list the cost per participant, support staff, and other relevant costs? To what extent does the budget narrative/justification clearly document how each line item is calculated and why each line item request supports the goals and activities of the proposed project?

Evaluation Criteria for Proposals Submitted Under Priority 2: Improvement of the Technology for Record Linkage and Entity Resolution

a. Criterion 1 – Intellectual Merit (30%):

The Intellectual Merit criterion encompasses the potential to develop a record linkage system that delivers record linkage quality relative to the quality of the current state of Census Bureau record linkage systems, provides quality metrics for the linkages, can be used for both person and business entity resolution, and that can be implemented at sufficient scale and speed to be used in large-scale production as experienced at the Census Bureau and other large statistical organizations. The Intellectual Merit criterion also includes the conceptual and operational alignment of the key technical features of the proposed “sandbox” test datasets with important high-priority challenges identified in the background statement for Priority 2, e.g., scale and complexity. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the application address the approach/soundness of design: i.e., Are the conceptual framework, design, methods, and analyses suited to the project goals and objectives? Have potential issues and challenges been identified along with mitigation strategies? Does the plan incorporate a mechanism to assess success? What performance metrics will be used to

monitor, measure, and evaluate the success or failure of the project?

b. Criterion 2 – Broader Impacts (30%):

The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes, as aligned with the content of this NOFO. To what extent are the proposed solutions (as proposed for parts (a)-(c) in the ‘Project Description’ under Section I.B. for priority 2) portable to other government agencies and organizations outside government that engage in record linkage and entity resolution? Does the project employ novel concepts, approaches or methods? Does the project develop new technologies? Does the project develop a system requiring minimal alterations to perform entity resolution for different use cases? To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts? A potentially transformative project is defined as something that has the potential to move the field forward in a substantial way (i.e., a game--changer).

c. Criterion 3 – Overall Qualifications of Applicants (20%):

How well qualified (as indicated by relevant training, experience, and record of productivity in applicable technical areas) is the individual, team, or organization to conduct the proposed activities? Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

d. Criterion 4 - Project Costs (20%):

This Project Cost criterion evaluates the budget to determine if it is realistic and commensurate with the project needs and timeframe. Does the proposed budget include sufficient details, with appropriate breakdown and justification of costs by object class? Is the proposed budget cost-effective and realistic based on the applicant’s stated objectives, technical approach, and time frame? Does the budget list the cost per participant, support staff, and other relevant costs? To what extent does the budget narrative/justification clearly document how each line item is calculated and why each line item request supports the goals and activities of the proposed project?

B. Review and Selection Process

Once a full application package has been received, applications will undergo an initial administrative review by Federal employees to determine eligibility for award, compliance with submission requirements, and completeness of the application. Applications determined to be ineligible, incomplete, and/or non-responsive based on the initial screening

will be eliminated from further review and the PIs will be notified. However, BOC may continue the review process for an application that is missing non-substantive information that can easily be rectified or cured.

All eligible applications (proposals) will be evaluated and ranked as ‘Outstanding’, ‘Above Average’, ‘Average’, ‘Below Average’ or ‘Poor’, individually by, at a minimum, three merit reviewers knowledgeable about the program to determine how well each proposal application meet program priorities and evaluation criteria of this announcement.

All compliant applications (proposals) will then receive an objective panel peer review within one of the two priority category pools to which it was submitted. All proposals within a given priority category pool will be competed and ranked against each other for final consideration by the program office. The Selecting Official, or designee will make final application selections in rank order, taking into consideration the results of the merit reviewer’s evaluations and relevance to the objectives described in this announcement.

The Selecting Official makes the final recommendation for award to the NOAA Grants Officer, in support of BOC, who is authorized to commit the Federal Government and obligate the funds. The Grants Officer may negotiate the final funding level of the proposal with the intended applicant. Any application considered for funding may be required to address any issues raised in the evaluation of the proposal by the reviewers, Program Officer, Selecting Official, and/or Grants Officer before an award is issued.

After applications are proposed for funding by the Selecting Official and prior to the issuance of an award, the NOAA Grants Management Division will conduct an assessment of the risk posed by the applicant in accordance with 2 C.F.R. § 200.206. In addition to reviewing repositories of government-wide eligibility, qualification or financial integrity information, the risk assessment conducted by NOAA may consider items such as the financial stability of an applicant, quality of the applicant’s management systems, an applicant’s history of performance, previous audit reports and audit findings concerning the applicant and the applicant’s ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities. Upon review of these factors, if appropriate, specific award conditions that correspond to the degree of risk may be applied by the NOAA Grants Officer pursuant to 2 C.F.R. § 200.208. In addition, the government reserves the right to reject an application in its entirety where information is uncovered that raises a significant risk with respect to the responsibility or suitability of the applicant.

The final approval of selected applications and issuance of awards will be by the NOAA Grants Officer. The award decisions of the Grants Officer are final. Unsuccessful applicants

will only be notified in writing.

C. Selection Factors

The Selecting Official anticipates recommending applications for funding in rank order unless an application is justified to be selected out of rank order based upon one or more of the following selection factors:

- a. Availability of funding
- b. Duplication of other projects funded or considered for funding by BOC or other federal agencies (if it does, it cannot be funded under this announcement);
- c. Variation of scientific or technical approaches or participants across funded projects.

D. Anticipated Announcement and Award Dates

Subject to the availability of funds, awards are expected to be made within two months after receipt by BOC of applications. Given this time frame, applicants applying in Fiscal Year 2021 should take into consideration that submissions received (30 days after publication) will not be considered.

Applicants that initiate award activities in anticipation of federal funding do so at their own risk, and are advised not to begin award-related work until a notice of award is received electronically from the NOAA GMD in Grants Online, NOAA's online financial assistance management system.

VI. Award Administration Information

A. Award Notices

The notice of award (CD-450) is executed by the NOAA Grants Officer and is the authorizing award document. It is generally provided electronically via NOAA's Grants Online system to the Authorized Representative of the recipient organization. The Authorized Representative for a successful applicant will accept the award via the Grants Online system. NOAA/BOC will notify unsuccessful applicants in writing. Those applications that are selected for funding will be retained by BOC for a period of three (3) years from the date of the awardee's final expenditure after which they will be destroyed.

B. Administrative and National Policy Requirements

a. Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements. The Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements contained in the Federal Register

notice of December 30, 2014 (79 FR 78390) are applicable to this solicitation and may be accessed online at <https://www.govinfo.gov/app/details/FR-2014-12-30/2014-30297>. To enable the use of a universal identifier and to enhance the quality of information available to the public as required by the Federal Funding Accountability and Transparency Act, 31 U.S.C. 6101 note, to the extent applicable, any proposal awarded in response to this announcement will be required to use the System for Award Management (SAM), which may be accessed online at <https://www.sam.gov/SAM/>. Applicants are also required to use the Dun and Bradstreet Universal Numbering System, as identified in OMB guidance published at 2 CFR Part 25, which may be accessed at <https://www.ecfr.gov/cgi-bin/text-idx?node=pt2.1.25&rgn=div5>.

Administrative and national policy requirements for all Department of Commerce awards are contained in the Department of Commerce Pre-Award Notification.

b. **Limitation of Liability.** Funding for programs listed in this notice is contingent upon the availability of Federal appropriations. Applicants are hereby given notice that funds may not yet have been appropriated for the programs listed in this notice. In no event will NOAA or the Department of Commerce be responsible for proposal preparation costs if these programs fail to receive funding or are cancelled because of other agency priorities. Publication of this announcement does not oblige NOAA or BOC to award any specific project or to obligate any available funds. Recipients and sub-recipients are subject to all Federal laws and agency policies, regulations and procedures applicable to Federal financial assistance awards.

c. **Unpaid or Delinquent Tax Liability.** In accordance with current Federal appropriations law, NOAA will provide a successful corporate applicant a form to be completed by its Authorized Representatives certifying that the corporation has no Federally assessed unpaid or delinquent tax liability or recent felony criminal convictions under any Federal law. The certification must be completed and submitted to NOAA before an award maybe issued.

Please see <https://www.noaa.gov/organization/information-technology/vi-award-administration-information> and <https://www.commerce.gov/sites/default/files/oam/FAM%202015-01.pdf> for further guidance.

d. Through 2 C.F.R. § 1327.101, the Department of Commerce adopted Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200, which apply to awards in this program. Refer to <http://go.usa.gov/SBYh> and <http://go.usa.gov/SBg4>.

C. Reporting

a. Reporting Requirements. The following reporting requirements described in Sections 1.a. Performance (Technical) Reports and 1.b. Financial Reports of the Department of Commerce Financial Assistance Standard Terms and Conditions dated November 12, 2020, <https://www.commerce.gov/oam/policy/financial-assistance-policy> to apply to awards in this program:

- **Financial Reports.** Each award recipient will be required to submit an SF-425, Federal Financial Report to the NOAA Grants Officer named in the award documents. An SF-425 is due 90 days after the end of the project period. Each award recipient will also be required to submit an SF-270 for payments.
- **Performance (Technical Reports).** Each award recipient will be required to submit a technical progress report to the NOAA Grants Officer and Federal Program Officer through the automated Grants On-Line system. Reports will be due within 30 days after the end of the reporting period. A final technical report shall be submitted within 90 days after the expiration date of the award. Technical progress reports shall contain progress to date and information as prescribed in 15 C.F.R. § 200.329, Monitoring and reporting program performance. Unless otherwise specified by the terms of the award, reports must be submitted electronically through NOAA Grants Online (<https://grantsonline.rdc.noaa.gov>).
- **Patent and Property Reports.** From time to time, and in accordance with the Uniform Administrative Requirements and other terms and conditions governing the award, the recipient may be required to submit property and patent reports.
- **Recipient Integrity and Performance Matters.** In accordance with section 872 of Public Law 110-417 (as amended; see 41 U.S.C. 2313), if the total value of a recipient's currently active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds \$10,000,000 for any period of time during the period of performance of an award made under this FFO, then the recipient shall be subject to the requirements specified in Appendix XII to 2 C.F.R. Part 200, <http://go.usa.gov/cTBwC>, for maintaining the currency of information reported to SAM that is made available in FAPIIS about certain civil, criminal, or administrative proceedings involving the recipient.

b. Audit Requirements. 2 C.F.R. 200 Subpart F, adopted by the Department of Commerce through 2 C.F.R. § 1327.101, requires any non-Federal entity (i.e., including non-profit institutions of higher education and other non-profit organizations) that expends Federal awards of \$750,000 or more in the recipient's fiscal year to conduct a single or program-specific audit in accordance with the requirements set out in the Subpart. Applicants are reminded that NOAA, the Department of Commerce Office of Inspector General or another

authorized Federal agency may conduct an audit of an award at any time.

Recipients that expend less than \$750,000 during the recipient’s fiscal year in Federal awards are exempt from Federal audit requirements for that year, except as noted in 2 CFR §200.503, but records must be available for review or audit by appropriate officials of the Federal agency, pass-through entity, and Government Accountability Office (GAO).

c. Federal Funding Accountability and Transparency Act of 2006. In accordance with 2 C.F.R. Part 170, all recipients of a Federal award made on or after October 1, 2010, are required to comply with reporting requirements under the Federal Funding Accountability and Transparency Act of 2006 (Pub. L. No. 109-282). In general, all recipients are responsible for reporting sub-awards of \$25,000 or more. In addition, recipients that meet certain criteria are responsible for reporting executive compensation. Applicants must ensure they have the necessary processes and systems in place to comply with the reporting requirements should they receive funding. Also, see the Federal Register notice published September 14, 2010, at 75 FR 55663 available here <https://www.govinfo.gov/content/pkg/FR-2010-09-14/pdf/FR-2010-09-14.pdf>.

VII. Agency Contacts

Questions regarding this should be directed to the points of contact listed below:

Subject Area	Point of Contact
Programmatic and Technical questions	Census Cooperative Agreements Team E-mail: ADRM.Agreements@census.gov

NOTE: Technical questions seeking to clarify information presented in the Program Priorities section will be fielded. However, the government cannot provide advice concerning the proposed technical direction of the applicant’s work and/or any information that could provide the proposer with an unfair advantage in the completion process.

Grants/Cooperative Agreement Rules Stacy Tedder, Grants Officer

and Regulations

NOAA Grants Management Division
E-mail: stacy.a.tedder@noaa.gov

NOTE: All questions shall be submitted in writing by electronic mail. Questions submitted via a telephone call, fax message, or other means will not be provided a response.

Technical Assistance with
Grants.gov Submissions

Grants.gov
Phone: 240-533-9533
<https://www.grants.gov/support.html>

VIII. Other Information

VIII. Other Information

1. Handling of Proprietary Information

The applicant acknowledges and understands that information and data contained in applications for financial assistance, as well as information and data contained in financial, performance and other reports submitted by applicants, may be used by the Department of Commerce in conducting reviews and evaluations of its financial assistance programs. For this purpose, applicant information and data may be accessed, reviewed and evaluated by Department of Commerce employees, other Federal employees, Federal agents and contractors, and/or by non-Federal personnel, all of whom enter into appropriate conflicts of interest and nondisclosure agreements covering the use of such information. As may be provided in the terms and conditions of a specific financial assistance award, applicants are expected to support program reviews and evaluations by submitting required financial and performance information and data in an accurate and timely manner, and by cooperating with Department of Commerce and external program evaluators. In accordance with 2 C.F.R. § 200.303(e), applicants are reminded that they must take reasonable measures to safeguard protected personally identifiable information and other confidential or sensitive personal or business information created or obtained in connection with a Department of Commerce financial assistance award.

In addition, Department of Commerce regulations implementing the Freedom of Information

Act (FOIA), 5 U.S.C. Sec. 552, are found at 15 C.F.R. Part 4, Public Information. These regulations set forth rules for the Department regarding making requested materials, information, and records publicly available under the FOIA. Applications submitted in response to this Federal Funding Opportunity may be subject to requests for release under the Act. In the event that an application contains information or data that the applicant deems to be confidential commercial information that should be exempt from disclosure under FOIA, that information should be identified, bracketed, and marked as Privileged, Confidential, Commercial or Financial Information. In accordance with 15 CFR § 4.9, the Department of Commerce will protect from disclosure confidential business information contained in financial assistance applications and other documentation provided by applicants to the extent permitted by law.

2. Notices to Applicants

The government may select some, all, or none of the applications, or part(s) of any particular application to award. The Government is not obligated to make any award as a result of the announcement or that only Grant Officers can bind the government to the expenditure of funds.

3. Grants.gov Information

Potential funding applicants must register with Grants.gov before any application materials can be submitted. An organization's one time registration process may take up to three weeks to complete. Applicants must allow sufficient registration time to ensure applications are submitted before the proposal submission deadline. To use Grants.gov, applicants will be required to use the System for Award Management (SAM), which may be accessed online at <https://www.sam.gov/SAM/>. Applicants are also required to use the Dun and Bradstreet Universal Numbering System, as identified in OMB guidance published at 2 CFR Part 25, which may be accessed at <https://www.ecfr.gov/cgi-bin/text-idx?node=pt2.1.25&rgn=div5>. The Grants.gov site contains directions for submitting an application, the application package (forms), and is also where the completed application is submitted. Applicants using Grants.gov must locate the downloadable application package for this solicitation by the Funding Opportunity Number or the CFDA number (11.016), Statistical, Research, and Methodology Assistance. Applicants will be able to download a copy of the application package, complete it offline, and then upload and submit the application via the Grants.gov site.

After electronic submission of the application, the person submitting the application will receive within the next 24 to 48 hours two email messages from Grants.gov updating them on the progress of their application. The first email will confirm receipt of the application by

the Grants.gov system, and the second will indicate that the application either has been successfully validated by the system before transmission to the grantor agency or has been rejected because of errors. After the application has been validated, this same person will receive another email when the application has been downloaded by the federal agency.

4. Past Performance and Non-Compliance with Award Provisions

A consistent pattern of unsatisfactory performance under prior federal awards may result in an application not being considered for funding. Failure to comply with any or all of the provisions of an award may have a negative impact on future funding by the Department of Commerce (or any of its operating units) and may be considered grounds for any or all of the following actions: establishment of an account receivable, withholding payments under any Department of Commerce awards to the recipient, changing the method of payment from advance to reimbursement only, imposition of other specific award conditions, suspension of any active Department of Commerce awards, and termination of any active Department of Commerce awards.

Appendix A: NOAA Grants Management Division's Budget Narrative Guidance

All applications must have a detailed budget narrative explaining and justifying the federal and the non-federal expenditures by object class category as listed on SF-424A - Section B (Budget Category) for non-construction awards (and the SF-424C for construction awards). For clarification and simplicity, it is best to discuss each expense by object class in the order that they appear on the SF424A. Include detailed descriptions of all cost justifications (see below for more detail). Additionally, provide any cost sharing and matching funds in the same level of detail as the federal funds. The budget narrative submitted with the application must match the dollar amounts on all required forms. Please explain each calculation and provide a narrative that supports each budget category (the SF-424 must equal total costs identified on the SF-424A form which must match the budget narrative).

Costs proposed to NOAA awards must be reasonable, allowable, allocable, and necessary to the supported activity. Refer to 2 CFR §200 for applicable administrative requirements and cost principles. The SF424 family forms can be accessed at <http://www.grants.gov/web/grants/forms/sf-424family.html#sortby=1>. If your award is for multi-year or multiple year funding, you must provide a budget and budget justification for each year. Show each year in a separate column on the SF-424A and use a separate column for listing any match funds. NOAA expects that applicants will ensure that no Federal or non-Federal grant funds will be expended for in-kind goods or services, for purposes of

providing transportation, travel, and other expenses for any Federal employee.

Personnel

Provide the name of the person in each position (if known), and provide both the annual (for multiyear awards) and total: salary/amount each position is paid; the percent of time position contributes to this award; and the number of months the employee is paid. Personnel wages can be found on the Bureau of Labor Statistics Occupational Employment Statistics (OES) website at <http://www.bls.gov/ncs/ocs/>. State if any positions are vacant at the time, and if so, anticipated hire date. Also, provide a justification and description of each position (including vacant positions). Relate each position specifically to program objectives. Personnel cannot exceed 100% of their time on all active projects. Recipient should ensure the cost of living increase is built into the budget and justified.

The salaries of administrative and clerical staff should normally be treated as indirect (F&A) costs (2 CFR §200.413c). Direct charging of these costs may be appropriate only if all of the following conditions are met: (1) Administrative or clerical services are integral to a project or activity; (2) Individuals involved can be specifically identified with the project or activity; (3) Such costs are explicitly included in the approved budget or have the prior written approval of the Grants Officer; and (4) The costs are not also recovered as indirect costs.

Sample Budget

PERSONNEL Total \$ _____

Position Title

& Name	Yearly Salary	% of Time	No. of Months	\$Amount
PI, Jane Doe	[amount]	[percent]	[amount]	[amount]
Project Coordinator, John Doe	[amount]	[percent]	[months]	[amount]
Education Specialist, Janet Doe	[amount]	[percent]	[months]	[amount]

Administrative

Assistant,

Jane Doe [amount] [percent] [months] [amount]

Sample Justification

Project Coordinator - [Name]: This position directs the overall operation of the project; responsible for overseeing the implementation of project activities, coordination with other agencies, development of materials, provision of in-service and training, conducting meetings and coordinating with agencies, designs and directs the gathering, tabulating and interpreting of required data, responsible for overall program evaluation and for staff performance evaluation; and is the responsible authority for ensuring necessary reports/documentation are submitted to NOAA. This position relates to all program objectives. John Doe will provide 10 months effort for a total of \$xx each year for three years (total \$xx).

Fringe Benefits

Fringe benefits are usually applicable to direct salaries and wages. Provide the fringe benefit rate used and a clear description of how the computation of fringe benefits was done. Provide both the annual (for multiyear awards) and total. If a fringe benefit rate is not used, show how the fringe benefits were computed for each position. The budget justification should be reflected in the budget description. Elements that comprise fringe benefits should be indicated. The fringe rate should be proportional among the federal and non-federal share categories. If a fringe rate is greater than 35%, a description and breakdown of the benefits must be provided unless a negotiated indirect cost rate agreement (NICRA) has been provided. If fringe benefits are not computed by using a percent of salaries, provide a breakdown of how the computation is done. The applicant should not combine the fringe benefit costs with direct salaries and wages in the personnel category.

Sample Budget

FRINGE BENEFITS

Total \$ _____

Project Coordinator - Salary	[amount]
Retirement 5% of \$35,000 =	[amount]
FICA 7.65% of \$35,000 =	[amount]

Insurance = [amount]
 Workman’s Compensation, etc. = [amount]
 Total = [amount]

Position Title

& Name	Yearly Salary	% Rate	\$ Amount
Project Coordinator, John Doe	[amount]	[percent]	[amount]
Education Specialist, Janet Doe	[amount]	[percent]	[amount]
Project Assistant, Grad student	[amount]	[percent]	[amount]
Administrative Assistant, Jane Doe	[amount]	[percent]	[amount]

Sample Justification

The fringe benefit rate for full-time employees for years one and two is calculated at 33%. The fringe rate for the student is calculated at 7%. For years three and four, the fringe rate is anticipated to increase to 34% for employees and remain at 7% for graduate students.

Travel

Provide both the annual (for multiyear awards) and total for domestic and foreign travel.

¿ Domestic Travel: Domestic travel includes travel within and between the U.S., the commonwealths of Puerto Rico and the Northern Mariana Islands, Guam, the U.S. Virgin Island, and the territories and possessions of the United States. Provide a narrative justification describing the travel staff will perform. List origin and destination, number of trips planned, who will be making the trip, purpose of travel and how it relates to the scope of work, and approximate dates. If mileage is to be paid, provide number of miles and the cost per mile. If travel is by air, show cost of airfare and proposed airline (if known). If per diem/lodging is to be paid, indicate number of days and the amount for each day’s per diem and the number of nights and the amount for each night’s lodging. Include any ground transportation when applicable. Total each trip planned.

¿ Foreign Travel: Travel outside the areas specified above is considered foreign travel. Provide a narrative justification describing the same information as above. Follow above format. Certify compliance with the Fly America Act. The Fly America Act limits the use of

foreign flag carriers to foreign travel. A waiver is only allowed for specific instances and will require prior approval. See <http://www.gsa.gov/portal/content/103191> for more information.

Dollars requested in the travel category should be for staff travel only. Travel for consultants should be shown in the consultant category along with the consultant’s fee. Travel for training participants, advisory committees, review panels and etc., should be itemized the same way as indicated above and placed in the “other” category. Travel should include: origin and destination, estimated costs and type of transportation, number of travelers, related lodging and per diem costs, brief description of the travel involved, its purpose, and explanation of how the proposed travel is necessary for successful completion of the project.

If travel details are unknown, then the basis for proposed costs should be explained (i.e., historical information). Travel costs can be charged on an actual basis, on a per diem or mileage basis in lieu of actual costs incurred, or a combination of the two if applied consistently and results in reasonable charges. Travel support for dependents of key project personnel may be requested only when the travel is for a duration of six months or more either by inclusion in the approved budget or with the prior written approval of the Grants Officer (2 CFR §200.474(c)(2)).

Sample Budget

TRAVEL - DOMESTIC	Total \$
<hr/>	
Domestic Travel:	
1 trip x 1 person @ \$800 airfare =	[amount]
2 days per diem x \$37/day x 2 people =	[amount]
1 night’s lodging x \$67/night x 2 people =	[amount]
Ground transportation 1 person =	[amount]
Total =	[amount]

Sample Justification

The Project Coordinator and the Education Specialist will travel to [event location] to provide training at the “Train the Trainers” workshop being held [date]. They will both travel from [origin] to [destination], and take ground transportation from the airport to the event/hotel.

Provide a lease versus purchase analysis. This must accompany every equipment request over \$5,000 even if a lease vs purchase analysis cannot be completed, a statement is required to that effect. General purpose equipment such as office equipment and furnishings, and information technology equipment and systems are typically not eligible for direct cost support (2 CFR §200.439).

Provide objective-related justification for all equipment items after the detailed budget. The source for determining the budget price for each unit of equipment should be included in the justification.

Sample Budget

EQUIPMENT	Total \$
[Item] =	[amount]
[Item] =	[amount]
[Item] =	[amount]
Total	[amount]

Sample Justification

Equipment costs of [\$ amount] is requested for modified gill nets (1x\$20,000), anchors (2x\$6,000), floating and acoustic transmitters and receivers (4x\$10,000). The gill nets will be used for [description]. The anchors are needed for [description]. The transmitters and receivers will be used for [description].

Supplies

List by supply item. An explanation is necessary for supplies costing more than \$5,000, or five percent of the award, whichever is greater. Show unit cost of each item, number needed, and total amount. Provide both the annual (for multiyear awards) and total for supplies. Provide justification of the supply items and relate them to specific program objectives. It is recommended that when training materials are kept on hand as a supply item, that it be included in the “supplies” category. When training materials (pamphlets, notebooks, videos, and other various handouts) are ordered for specific training activities, these items should be itemized and shown in the “other” category. If appropriate, general office supplies may be shown by an estimated amount per month multiplied by the number of months in the budget period.

Requirements for supplies which exceed the thresholds: explain the type of supplies to be purchased, or nature of the expense in the budget narrative; provide a breakdown of supplies by quantity and cost per unit if known; and indicate basis for estimate of supplies, i.e., historical use on similar projects.

Sample Budget

SUPPLIES	Total \$
----------	----------

General office supplies (pens, pencils, paper, etc.)	
Lab supplies (developing chemicals, petri dishes, etc.)	

12 months x \$100/month =	[amount]
2,000 pamphlets entitled [name] x \$.58 ea. =	[amount]

Sample Justification

General office supplies will be used by staff to carry out daily activities of the program. Pamphlets will be kept in stock and distributed to schools as needed upon request. Supplies relate to (describe how pamphlets relate to objectives).

Contractual

Provide separate budgets for each contract, regardless of the dollar value and indicate the basis for the cost estimates in the narrative. Describe products or services to be obtained and indicate the applicability or necessity of each to the project.

Please note the differences between contract and vendor:

- ⌚ Contract means a legal instrument by which a non-Federal entity purchases property or services needed to carry out the project or program under a Federal award.
- ⌚ Vendor is generally a dealer, distributor or other seller that provides, for example, supplies, expendable materials, or data processing services in support of the project activities.

Provide both the annual (for multiyear awards) and total for contractual. Do not incorporate contractual indirect costs under the indirect costs line item for the applicant/grantee on the SF-424A or budget narrative.

- ⌚ Name of Contractor or Vendor: Include the name of the qualified contractor, affiliation,

and contact.

¿ Method of Selection: Include how selection was made. If Sole Source, the justification must certify that the award of a contract through full and open competition is infeasible. Also that: (1) the item/service is available only from one source; (2) the public exigency or emergency for the requirement will not permit a delay resulting from competitive solicitation; and (3) competition is determined inadequate after solicitation of a number of sources. Include qualifications.

¿ Period of Performance: Include the dates/length for the performance period. If it involves a number of tasks, include the performance period for each task.

¿ Scope of Work: List and describe the specific tasks to be performed.

¿ Criteria for Measuring Accountability: Include an itemized line item breakdown as well as total contract/award amount. If applicable, include any indirect costs paid under the contract/award and the indirect cost rate used.

Sample Budget

CONTRACTUAL	Total \$
-------------	----------

Name of Organization

Method of Selection (competitive or sole source; if sole source, provide justification)

Period of Performance

Description of Activities

Method for Maintaining Performance Accountability

Itemized Budget (include categories used in program budget)

Sample Justification

Contractual costs of [\$ amount] is requested for the university to execute a contract with TBD, competed competitively, for [\$ amount] to develop and deploy satellite tags on North Atlantic right whales for 2016 (one year). Expenses will include: (1) personnel and fringe for a technician to implement tag development and testing during Year 1, (2) expenses TBD to travel to Seattle, WA to meet with XX computers engineers to develop a GPS-linked satellite tag, (3) travel for TBD to the Southeast U.S. to lead tag deployments in 2015 and 2016, and (4) tagging supplies (satellite tags, tag darts, measurement electronics for tag testing, other tag testing supplies). TBD will report to the university quarterly to ensure progress. [Attach itemized budget.]

Construction

Construction activity is allowable only when program legislation includes specific authority for construction and/or when the DOC operating unit specifically authorizes such activity. Activities under an award are considered construction when the major purpose of the award is construction as defined in this chapter. In contrast, alteration of facilities incidental to a non-construction purpose is not considered construction under this chapter.

Most federal programs do not allow construction costs, and those that do typically have detailed instructions describing how to figure construction costs. Estimated construction costs must be supported by documentation including drawings and estimates, formal bids, etc. As with all other costs, follow the specific requirements of the program, the terms and conditions of the award, and applicable regulations.

Whereas non-construction awards use the SF-424A form; construction awards must use the SF-424C form. Detail provided should include: administrative and legal expenses; land, structures, rights-of-way, appraisals, etc.; relocation expenses and payments; architectural and engineering fees, project inspection fees; site work; demolition and removal; equipment; contingencies; and program income.

Other

This category contains both sub awards and other items not included in the previous categories.

¿ Sub awards. Provide separate budgets for each sub award, regardless of the dollar value and indicate the basis for the cost estimates in the narrative. Indicate the applicability or necessity of each sub award to the project. A sub award is an award provided by a pass-through entity to a subrecipient for the subrecipient to carry out part of a Federal award, including a portion of the scope of work or objectives. Provide the name of the subrecipient, method of selection, period of performance, scope of work, and criteria for measuring accountability for each sub award. In addition, provide both the annual (for multiyear awards) and total for sub awards and other items. Do not incorporate indirect costs incurred by sub awards under the indirect costs line item for the applicant/grantee on the SF-424A or budget narrative. (It is recommended that sub awards fall under the other section; however, the applicant may opt to categorize sub awards under the contractual. The applicant should be clear in the different regulations/requirements between contracts and sub awards.)

¿ Other. List items by type of material or nature of expense, break down costs by quantity and cost per unit if applicable, state the necessity of other costs for successful completion of the project and exclude unallowable costs (i.e., alcohol, fundraising, meals and coffee

breaks). Provide both the annual (for multiyear awards) and total for other. Give justification for all the items in the “other” category (e.g., separate justification for printing, telephone, postage, rent, etc.). All costs associated with training activities should be placed in the “other” category except costs for consultant and/or contractual. List all expenses anticipated for the training activity in the format above. Include rental space for training (if required), training materials, speaker fees, substitute teacher fees, and any other applicable expenses related to the training. Allowable conference costs paid by the non-Federal entity as a sponsor or host of the conference may include rental of facilities, speakers' fees, costs of meals and refreshments, local transportation, and other items incidental to such conferences unless further restricted by the terms and conditions of the Federal award. As needed, the costs of identifying, but not providing, locally available dependent-care resources are allowable. Conference hosts/sponsors must exercise discretion and judgment in ensuring that conference costs are appropriate, necessary and managed in a manner that minimizes costs to the Federal award (2 CFR Part 200.432). Furthermore, if such costs are unallowable by the recipient, they cannot be charged solely to the Federal award.

Total Direct Charges

Show total direct costs by listing totals of each category.

Sample Budget	Total \$
<hr/>	
A. Personnel [amount]	
B. Fringe [amount]	
C. Travel [amount]	
D. Equipment [amount]	
E. Supplies [amount]	
F. Contractual [amount]	
G. Construction [amount]	
H. Other [amount]	
Total Direct Costs [amount]	

Indirect Charges

Indirect costs are those costs incurred for common or joint objectives which cannot be readily identified with an individual project or program but are necessary to the operations of the organization. The following types of indirect cost rates apply:

ζ Fixed. Established for a future period based on estimates of costs for that period. They are subject to adjustments using a "carry forward" method. Although there is no adjustment of the rate for the current year, the difference between the estimated rate and the actual rate is carried forward in establishing the rate for a subsequent period.

ζ Provisional. Temporarily established for an award to permit funding and reporting of indirect costs pending the establishment of a final rate. Billings and charges to contracts and grants must be adjusted if the final rate varies from the provisional rate.

ζ Pre-determined. Established for a future period on an estimate of costs for that period. This type of rate is not subject to subsequent adjustments. It is used only where cost experience is such that the actual indirect cost can be accurately predicted.

Recipients can receive a one-time extension of up to four years on their existing rate. Please refer to the DOC Financial Assistance Standard Terms and Conditions and the 2 CFR 200 for more information about indirect costs and facilities and administrative costs, including more information regarding pre-determined, provisional, and fixed rates.

Provide the most recent negotiated indirect cost rate agreement (NICRA) with the itemized budget. The applicable indirect cost rate(s) negotiated by the organization with the cognizant negotiating agency must be used in computing indirect costs (F&A) for a proposal (2 CFR §200.414). The amount for indirect costs should be calculated by applying the current negotiated indirect cost rate(s) to the approved base(s). If a recent NICRA is not in the application package, and is not filed in the organization profile, the grants specialist should first search the HHS Rate Agreement Distribution System (RADS) at <https://rates.psc.gov/dcaweb/> prior to reaching out to the recipient. If the Grants Specialist is unable to obtain a recent NICRA from RADS and the applicant, the Grants Specialist, as a last resort, can include a special award condition on the award for the applicant to submit a Federally Approved Indirect Cost Rate schedule within 90 days.

In accordance with 2 CFR § 200.414 (f), any non-Federal entity that does not have a current negotiated (including provisional) rate, except for those non-Federal entities described in appendix VII to this part, paragraph D.1.b, may elect to charge a de minimis rate of 10% of modified total direct costs (MTDC) which may be used indefinitely. No documentation is required to justify the 10% de minimis indirect cost rate. Applicants proposing a 10 percent de minimis rate pursuant to 2 C.F.R. § 200.414 (f) should note this election as part of the budget and budget narrative portion of the application. Indirect costs proposed under the award must be clearly identified as a separate budget line item. Foreign grantees that do not have a negotiated indirect cost rate may also elect to charge the de minimis rate limited to an

indirect cost rate recovery of 10% of modified total direct costs, and foreign grantees that have a negotiated rate agreement with a U.S. federal agency may recover indirect costs at the current negotiated rate.

(Only mandatory cost sharing or cost sharing specifically committed in the project budget must be included in the organized research base for computing the indirect (F&A) cost rate or reflected in any allocation of indirect costs.)

Sample Budget

INDIRECT COSTS Total \$

The rate is _____ % and is computed on the following direct cost base \$ _____.

- Personnel
- Fringe
- Travel
- Supplies
- Other
- Total

Multiplied by Indirect Cost Rate _____ %

Total Indirect Costs [amount]

Totals - Direct and Indirect Charges

Provide the total combined direct and indirect costs budgeted.

Cost Share or Match

If a non-Federal cost share or match is required for this award, demonstrate it meets the matching requirements. Provide sources of the match and provide adequate documentation for in-kind match. The match should provide the same level of detail as the federal share outlined in this guidance; therefore, it should be broken down by object class category (personnel, fringe, travel, equipment, supplies, contractual, other, indirect costs, etc.) The non-federal share is subject to the same regulations as the federal share. If the recipient cannot meet the cost share/match stated in its application, the Federal award should be

reduced by the same percentage. (See reference under “Indirect Charges” regarding cost sharing and indirect (F&A) cost rate computation.)

This document is subject to change.