Analysis Plan

Evaluation Name: Bringing Rural Small Businesses Already Selling to States Into Federal Procurement

Evaluation Code: 2605

Date Finalized: 8/19/2026

Project Description

This evaluation is designed to build evidence in response to the third key question in SBA's FY2026 Annual Evaluation Plan: **How can the SBA increase rural business participation in the federal marketplace?**

OES and SBA's FY25 descriptive evaluation, Understanding Rural Small Businesses In the Federal Marketplace, offered an overview of rural small business participation in the federal marketplace. Of all firms registered on SAM.gov, only 8.5% are rural small businesses. Rural small businesses receive 2.8% of prime awards and 3.5% of subcontracts, and these are highly concentrated in two industries — with NAICS codes 11 (Agriculture, Forestry, Fishing, and Hunting) and 21 (Mining, Quarrying, and Oil and Gas Extraction).

A key barrier limiting rural small businesses' participation in federal procurement may be a lack of awareness of how to register for federal procurement and how their experience with state procurement could translate to the federal marketplace. Even firms that are aware may avoid participating due to the administrative burden of registering on SAM.gov.

This project tests whether targeted email outreach to rural small businesses already engaged in state-level contracting but *not* registered on SAM.gov can increase SAM.gov registrations and engagement with SAM.gov resources. We vary the email content by emphasizing SBA as a directive instructor, or as a helpful aide. The Instructor email uses plain language, clear requisites, light loss framing, and a concrete registration pathway, with direct links to SAM.gov registration and current opportunities. The Aide email uses a less directive framing and points to a broader set of SBA resources without steering firms toward a single next step, while still including the same SAM.gov and opportunities links. Control firms receive no outreach.

This project draws on a state-level business dataset assembled by OES. To assemble this dataset, OES sourced business registers from 19 different states, containing a total of 1.2 million businesses. After filtering for businesses that are small and rural, have contact information, and are not already registered in SAM.gov, the final target sample for this evaluation is ~167,000 small rural businesses from 14 states.

This study will measure the effect of assignment to one of two email variations on a firm's SAM.gov registration. It will also measure the comparative effect of the Instructor and Aide emails on email clicks and SAM.gov registrations.

Preregistration Details

This Analysis Plan will be posted on the OES website at oes.gsa.gov before outcome data are analyzed.

Hypotheses

H1: Firms that receive **any email** will have different SAM.gov **registration rates** than firms that **receive nothing**.

H2: Firms that receive the **Instructor email** will have different **link click rates** than firms that receive the **Aide email.**

H3: Firms that receive the **Instructor email** will have different SAM.gov **registration rates** than firms that receive the **Aide email.**

Power

We assessed power with Monte Carlo simulations of the planned design. We block randomized by state, with 40% Instructor, 40% Aide, 20% Control assignment probabilities over N=166,000 firms. Two-sided OLS tests were performed according to the confirmatory analyses specified above, with Benjamini-Hochberg adjustments across H1-H3 with alpha at 0.05/ Simulations assumed a 10% email open rate among Instructor and Aide groups and examined small Registration and Click effect sizes on the order of 1-2 percentage points. Under those assumptions, the design is well powered for Click (H2: power roughly 0.98 for a 2 pp Instructor-Aide difference) but modestly powered for Registration (roughly 0.13 for a 2pp any-outreach/Instructor vs-Control contrast (H1) and roughly 0.37 for a 1 pp Instructor-Aide contrast (H3). Joint 80% power across all three BH adjusted tests requires larger Registration effects (on the order of ~6 pp on H1 in the design-stage simulations) We therefore treat Registration as confirmatory but interpret nulls cautiously, using Click and exploratory engagement for context.

Data and Data Structure

Data Source(s)

The two datasets will be compiled for the purposes of measuring outcomes: (1) Entity registration dataset; and (2) Click dataset.[1]

1) *Entity registration dataset*

To track Registration, we download the publicly available entity registration data at the end of our evaluation period (July to September 2026). This database is updated monthly, and allows us to identify new registrations since the pre-intervention baseline.

2) *Click dataset*

We deliver Instructor and Aide outreach via GovDelivery. GovDelivery provides, for each recipient: which links were clicked (and how many times), and the date/time of each click. Click outcomes are constructed at the firm level from these engagement records.

Outcomes To Be Analyzed

Federal statute mandates that the government direct at least 23% of all contracting dollars to small businesses. SBA provides resources to rural small businesses to help them navigate federal procurement. Ideally, we would directly measure the number of federal awards to rural small businesses, or the number of

[1] Details of collection procedures are in the Project Design Document (Evaluation design → Data).

rural small businesses bidding on federal contracts. However, due to the time constraints of this intervention and the confidentiality of bidding information, we are using a range of proxy outcome measures.

It's important to note that this intervention is expected to yield both short-term and long-term outcomes. There is presumably a time lag between businesses becoming familiar with federal procurement and completing their registration on SAM.gov. Therefore, relying solely on SAM.gov registration rates as the primary outcome variable may lead to an underpowered analysis and incorrect conclusions. In the future, SBA and/or OES could re-examine SAM.gov registration rates over longer post-intervention windows by treatment groups to evaluate longer-term effectiveness.

Short-Term Primary Target Outcomes:
We are interested in two primary outcomes: 1) SAM.gov registration (**"Registration"**); and 2) engagement with SAM.gov resources, which we proxy for using clicks (**"Click"**) on links embedded in the Instructor and Aide emails: *SAM.gov registration* or *current contract opportunities*.

1. Outcome Measure 1: **Registration**
    a. Definition: Whether or not a firm is registered in SAM.gov as of the end-of-evaluation
    b. Measurement: Download of entity data from SAM.gov and a fuzzy match process with the sample entity data used for randomization
    c. Code: Registration = 1 if a firm is registered in SAM.gov at the end of evaluation and Registration = 0 if not
    d. Time period: 10 weeks after initial outreach message in July 2026, also referred to as endline — September 23, 2026
2. Outcome Measure 2: **Click**
    a. Definition: Engagement with SAM.gov resources
    b. Measurement: Clicks on one of the two outcome measure links in the email: *SAM.gov registration instructions* or *current contract opportunities*
    c. Code: Click = 1 if an email recipient clicks on at least one of the two links at least once during the evaluation period and Click = 0 if not
    d. Time period: We will measure click outcomes at the following interval:
        - 10 weeks after initial outreach message, also referred to as endline— September 23, 2026

Note Click is defined only for firms assigned to Instructor or Aide (firms that were sent outreach). Control firms are not included in Click analyses because they receive no email and therefore have no Click outcome. Registration is defined for all three arms.

Exploratory Analyses:
We will conduct exploratory analyses on the following:

- Number of **emails opened**
- Number of **clicks on each link in the email**

Longer-term outcomes (bidding behavior; contract awards) are of interest to SBA but are outside this evaluation's measurement window and are not confirmatory outcomes.

Imported Variables

Experimental design - blocking variables

We block the data into the three groups (Instructor, Aide, Control) based on the database through which the business entered the **state** dataset. Note: the actual business location may differ from this.

For our analyses we use a firm-level file that merges: (1) the randomized intervention sample and arm assignments, (2) registration outcomes from SAM.gov, (3) Click outcomes from GovDelivery engagement for Instructor and Aide-assigned firms. Only the following classes of variables are required for the main confirmatory analyses:

- Randomized arm indicator for Instructor, Aide and Control
- State indicator (from state registry that contribute the firm)
- Firm identifier (FirmID)
- Binary registration (all arms) variable
- Click variable (Instructor and Aide arms)

Registration: We also pull firm-level SAM.gov entity information in the PUBLIC Monthly V2 extract accessed after August 29 which has information on the current list of firms registered on SAM.gov. We will be using this list to construct one of the main outcome variables, `Registration`, detailed in the section below.

Transformations Of Variables

Registration: We create a binary firm-level outcome, Registration, equal to 1 if the firm is matched to a SAM.gov entity in the PUBLIC Monthly V2 extract accessed after August 29, and 0 otherwise. Matching uses the latest `SAM_PUBLIC_MONTHLY_V2_YYYYMMDD.dat` extract available at endline.

We construct the Registration match twice: (1) in a pre-treatment window, using a SAM.gov PUBLIC Monthly V2 extract from before intervention launch, to characterize baseline registration status and to check for firms that already matched SAM before outreach; and (2) at endline, using the post–August 29 extract described above, which defines the confirmatory Registration outcome.

We conduct fuzzy matching and pre-specify its procedure here for the following reasons: SAM.gov does not contain state firm IDs, so we link firms by business name (legal name, and, when available, "doing business as" DBA information). Exact string equality is too brittle (e.g. "Inc." vs "Inc", minor typos) so we allow small spelling differences via Levenshtein distance. Fuzzy matching is inherently data-dependent if tuned after seeing outcomes; to avoid that, we **pre-specify** the procedure below to stay consistent with the name-matching approach already used when screening the intervention sample (i.e. identifying rural state registry firms that did not already appear in SAM.gov before randomization). The Registration outcome will follow this pre-specified rule any alternative thresholds or looser match definitions will be reported only as exploratory sensitivity checks.

What a match means: For each ERB firm we build five 0/1 indicators (`rule1`–`rule5`). A name comparison counts as a hit if the strings are identical after cleaning step for that rule, or if their Levenshtein distance is at most 2 (the same maximum distance used in the pre-randomization SAM.gov name screen). Intuitively, Rules 1-2 ask whether the firm's raw legal/DBA name (after light cleanup only) appears in SAM.gov. Rules 3-4 ask the same after stripping common legal-entity suffixes (so "ACME Rural LLC" can match "Acme Rural"). Rule 5 requires the SAM entity to be in the same state as the ERB firm's registry state, to reduce false matches from common business names in other states.

For all name rules we conduct a light normalize of the firm name" lowercase, trim whitespace, strip word-final periods (e.g. "Inc." and "Inc" compare as the same)/ For rules 3-4 we also use a legal-entity suffix strip that removes common entity suffixes such as LLC, Inc., Corp., LLP and a trailing standable "Co" (except after "&") applied up to six passes — the same suffix-stripping used when cleaning firm names for the intervention randomization file — then apply light normalize. The rules are below:

- **Rule 1:** original ERB legal name vs. original SAM legal name (light normalize only)

- **Rule 2**: original ERB DBA ("Doing Business As") name vs. original SAM DBA name (light normalize only)
- **Rule 3**: suffix-stripped ERB legal name vs suffix-stripped SAM legal name
- **Rule 4**: suffix-stripped ERB DBA vs suffix-stripped SAM DBA
- **Rule 5**: same-state indicator – ERB firm state equals SAM physical state

The confirmatory outcome coding is:

$$\text{Registration}=1\{\text{rule5}=1 \wedge (\text{rule1}=1 \vee \text{rule2}=1 \vee \text{rule3}=1 \vee \text{rule4}=1)\}$$

Unmatched firms are coded 0. Same-state is necessary but not sufficient: a name hit without a same-state SAM counterpart does not count as registered. The extract also includes SAM date fields (`initialRegistrationDate`, `registrationExpirationDate`, `lastUpdateDate`, `activationDate`, `entityStartDate`). We plan to further check that registration==1 reflects a new registration by verifying registrations on or after intervention launch July 15, 2026.

If a higher-quality ground truth link between ERB state registry firm names and SAM.gov entity names becomes available (for example, a verified crosswalk), we will incorporate that information into the Registration outcome to improve match precision relative to name-based rules alone. We will also use improved matching to revisit sample eligibility: firms that should have been excluded at construction as already SAM-registered (or otherwise ineligible) but were retained because of match error will be identified and removed from the confirmatory analysis sample, with counts of such exclusions reported. Separately, we will conduct human verification on a random draw of 1,000 firm names to assess match quality under the pre-specified rules. In addition to the name cleaning rules above, we will extend normalization to handle comma-separated name order and punctuation in entity suffixes so that equivalent strings match. For example, "Brown, John A." will match "John Brown", "John A. Brown", "John A Brown", and "Brown, John". And, "Offshootz, LLC" will match "OFFSHOOTZ LLC", "OFFSHOOTZ, LLC", "Offshootz, L. L. C." and "Offshootz, L.L.C.".

Click outcome: We will create a binary variable, **Click**, to measure email engagement for businesses that received an email (Instructor and Aide groups). A value of '1' is assigned if the business clicked on any key SAM.gov link (*new registration* or *current contract opportunities*) in the emails; '0' if they did not click on either. The data that serves as the basis for this outcome measure is obtained through the email engagement data from GovDelivery.

Transformations Of Data Structure

Analysis is cross-sectional at the firm level (one row per FirmID). GovDelivery click events are collapsed to a firm-level binary Click. SAM registration information is matched onto the firm file via fuzzy name matching to create binary Registration variable (=1 if registered, =0 if not). No panel transformation is used for confirmatory tests.

Data Exclusion

Confirmatory analyses use the final randomized firm sample (N=166,157) after pre-specified exclusions on sample construction: non-small/rural firms, SAM-registered firms, firms with duplicate cleaned firm names, and firms without a valid deliverable email. We do not drop additional observations for outlier outcome values. As noted under Outcomes, Click models use the Instructor/Aide subsample only; Registration models use the full randomized sample.

The primary intent-to-treat analysis will include all email addresses assigned to the Instructor and Aide groups, regardless of whether the email was successfully delivered. This includes addresses that were suppressed after randomization or experienced delivery failure. These addresses remain in the treatment

group because the causal comparison is based on treatment assignment rather than successful receipt. Delivery failure, suppression, and related measures will be reported descriptively.

Treatment Of Missing Data

Registration is coded 0/1 for all randomized firms after SAM matching; unmatched firms are treated as not registered (Registration = 0). Click is missing by design for Control and is analyzed only on the Instructor–Aide subset. We do not impute outcomes. If GovDelivery fails to return engagement records for an emailed firm, Click is coded 0 (no recorded click). Incomplete covariate fields used only for descriptives are reported as missing; confirmatory models include arm indicators and state fixed effects only.

We distinguish undelivered emails from unsubscribes. Undelivered status reflects failure to reach the inbox and is treated as a pre-treatment delivery characteristic; unsubscribe requires that the message was delivered and acted on, and is therefore post-treatment and not equivalent to non-delivery. Both undelivered and unsubscribe status are defined only for Instructor and Aide firms (Control receives no email). Firms that are undelivered or that unsubscribe are retained in the intent to treat sample and coded as zeroes on Registration and Click (where defined); neither group is dropped. Before confirmatory estimation, we will test whether undelivered status is balanced across Instructor and Aide. If undelivered status is not balanced, we will control for it in the confirmatory Instructor-Aide regressions, as pre-registered here. Because unsubscribes are post-treatment, we do not condition on or control for unsubscribe status in confirmatory models. For H1 (any email vs Control), undelivered status is not available for Control and is not used as a covariate.

Descriptive Statistics, Tables, and Graphs

We will report: (1) sample size by state and by arm (Instructor / Aide / Control); (2) sample means of Registration by arm and of Click by Instructor vs. Aide; (3) the confirmatory H1–H3 coefficient table (estimate, SE, raw p, BH-adjusted p); and (4) a plot of H1–H3 average treatment effects with 95% confidence intervals. Exploratory delivery/open/extra-click summaries will be reported as secondary descriptives.

Statistical Models and Hypothesis Tests

This section describes the statistical models and hypothesis tests that will make up the analysis — including any exploratory analyses that can be anticipated prior to analysis.

Statistical Models

The primary statistical model will estimate intent-to-treat effects of assignment to treatment using ordinary least squares. For binary outcomes, these are linear probability models. All models include state fixed effects to account for block randomization by state. Models include arm indicators only, no pre-treatment covariates.[2] In the analysis code, Instructor corresponds to $treat\_T$ and Aide to $treat\_P$.

For H1, we use the full randomized sample and estimate:

$$Registration_i = \alpha + \beta_1 treat\_any_i + \gamma_s + \epsilon_i$$

where $treat\_any_i$ is firm i's treatment assignment to the Instructor arm or Aide arm. The confirmatory parameter is the coefficient β_1 on $treat\_any_i$ (Instructor + Aide vs. Control effect on SAM.gov registration).

[2] An exception would be if we found imbalance in pre-treatment covariates, such as undelivered status, across treatment arms, in which case we would control for the pre-treatment covariates using Lin-style regressions (Lin 2013).

For H2 and H3, we restrict the sample to firms in the Instructor and Aide arms, who were sent emails and estimate:

$$Y_i = \alpha + \beta_1 treat\_T_i + \gamma_s + \epsilon_i$$

where $treat\_T_i$ is firm i's treatment assignment to the Instructor arm. The outcome Y_i is **Click** for H2 and **Registration** for H3, and the confirmatory parameters are the coefficients β_1 on $treat\_T_i$, the effect of Treatment vs. Aide.

Inference is two-sided. The family of H1 – H3 tests is adjusted using Benjamini–Hochberg FDR control at α = 0.05. This matches the Project Design Document estimands (Any email vs. Control on Registration; Instructor vs. Aide on Click; Instructor vs. Aide on Registration).[3]

Confirmatory Analyses

The confirmatory analyses are exactly H1–H3 as stated under Hypotheses. H1 reports the OLS coefficient on $treat\_any_i$ from the full-sample Registration model. H2 reports the OLS coefficient on $treat\_T_i$ from the Instructor–Aide Click model. H3 reports the OLS coefficient on $treat\_T_i$ from the Instructor–Aide Registration model. We reject a hypothesis if its Benjamini–Hochberg–adjusted p-value is below 0.05.

The table below maps each research question and hypothesis to its outcome and test. No heterogeneous treatment effects or additional pairwise contrasts are confirmatory.

Hypothesis / research question
RQ 1: Do outreach emails to rural small businesses already engaged in state-level contracting change rates of SAM.gov registrations?? H1: Firms that receive any email will have different SAM.gov registration rates than firms that receive nothing.
RQ 2: Relative to emails emphasizing SBA as a helpful aide ("Aide"), do emails emphasizing SBA as a directive instructor ("Instructor") change engagement with SAM.gov resources (link clicks)? H2: Firms that receive the Instructor email will have different link click rates than firms that receive the Aide email.
RQ 3: Relative to the Aide email, does the Instructor email change rates of SAM.gov registrations? H3: Firms that receive the Instructor email will have different SAM.gov registration rates than firms that receive the Aide email.

Exploratory Analysis

We will conduct exploratory analyses on the following:

[3] We use Benjamini-Hochberg FDR rather than FWER randomization-inference thresholds because H1-H3 are a small family of related confirmatory tests on rare binary outcomes, where FWER control might be over conservative for deciding which of these pre-specified nulls to reject.

- Number of emails **bounced back/could not be delivered**
- Number of **emails opened**
- Number of **clicks on resources and guiding information** materials

Exploratory analyses are not part of the BH-adjusted confirmatory family and will be clearly labeled as exploratory in reporting. Planned exploratory analyses include: (1) email bounce / non-delivery rates among Instructor and Aide; (2) email open rates; (3) clicks on additional non-primary resource links (e.g., SBA's website, SAM registration FAQs, assistance programs, counseling); and (4) descriptive engagement diagnostics used to interpret null confirmatory results. Longer-term bidding or award outcomes are out of scope for this evaluation window.

Inference Criteria, Including Any Adjustments For Multiple Comparisons

Significance level $\alpha=0.05$ (applied to Benjamini-Hochberg-adjusted p-values for H1-H3). Two tailed tests are applied throughout.

Limitations

Key limitations are documented in the Project Design Document (Limitations), including: possible low engagement reducing power for Registration; fuzzy-match error when excluding or coding SAM registration; email delivery failures; and the use of short-term proxies (Click, Registration) rather than bidding or awards. This Analysis Plan does not add further confirmatory adjustments for those limitations.

A further limitation for Click is possible non-human or automated clicking (for example, security scanners or bots). As an exploratory check, we will examine the timing between repeated clicks and related engagement patterns; very short inter-click intervals may indicate non-human activity. We will report rates of such cases by arm.

Link To An Analysis Code/Script

The analysis code script is in development and can be provided upon request.