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**Why Marketing Matters: Strengthening the Defense  
Supplier Base Through Better Communication with  
Industry**

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NAVAL POSTGRADUATE SCHOOL

# Why Marketing Matters: Strengthening the Defense Supplier Base Through Better Communication with Industry

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## Abstract

This paper demonstrates that the Department of Defense (DoD)’s primary methods of marketing requirements and soliciting information from prospective suppliers inhibit the military’s access to innovative nontraditional companies. To conduct this research, we leveraged qualitative and quantitative research techniques, including assessing the features of more than one million DoD solicitations from <https://beta.sam.gov> and surveying small businesses on the readability of DoD requirements. Our results concluded that DoD solicitations are not conducive to attracting nontraditional suppliers because they are difficult to discover, lack ample response time frames, are not easy to read or understand, and lack critical information. These and other factors deter innovative, nontraditional companies from participating in the DoD’s market research process, in turn limiting the pool of suppliers available to the military. We offer recommendations for how the DoD can improve the way it writes and markets solicitations to attract and engage innovative, nontraditional companies more competitively.

## Introduction

Over the last 2 decades, companies outside of the U.S. military’s traditional industrial base—rather than entrenched defense contractors—have increasingly driven advancements in areas of critical importance to national defense. This paradigm shift has forced the Department of Defense (DoD) to rethink how it sources and funds new technologies and has prompted continuous investment—to the tune of billions of dollars annually—in innovation initiatives and rapid acquisitions programs whose stated purpose is to accelerate the adoption of commercial technologies. In spite of these efforts, we demonstrated in research we published in 2020 that the vast majority of DoD suppliers, including participants in DoD innovation programs, continue to be legacy contractors (Bresler & Bresler, 2020). We posited that one reason why the DoD does a poor job of attracting innovative new vendors (“nontraditionals”) is its failure to adequately market its requirements to communities outside of the traditional defense industrial base (DIB). This research aims to explore that hypothesis in more detail. Specifically, we sought to analyze how the composition and marketing of DoD requirements impacts the military’s efforts to attract innovative, nontraditional suppliers.

## Research Approach

This paper begins by providing an overview of the DoD’s current methods of marketing open requirements (“opportunities” or “requirements”) and soliciting information from prospective suppliers (“supplier outreach”), including the Federal Acquisition Regulation (FAR),



which dictates these procedures. Next, employing quantitative and qualitative research techniques, we analyzed the extent to which these methods enable the DoD to engage innovative, nontraditional companies outside of the DIB. We primarily focused our analyses on the following criteria:

- **discoverability:** the extent to which nontraditionals can find relevant DoD opportunities
- **response time:** the number of days between when an opportunity is posted and when responses are due
- **content:** the extent to which requirements are written in a clear and readable fashion and the extent to which requirements contain the information needed for nontraditionals to adequately evaluate them
- **redundancy:** the extent to which multiple DoD/government entities are simultaneously seeking similar solutions and how redundancy may affect nontraditionals' ability to prioritize relevant opportunities

In each section, we demonstrate that the DoD's methods of marketing its requirements and conducting supplier outreach substantially inhibit the military's access to companies outside of the DIB. This finding offers important context relative to our 2020 research results insofar as it makes clear a driving factor behind the DoD's failure to introduce a significant number of innovative new suppliers into the defense market over the last decade. Throughout the paper, we offer concrete recommendations for how the DoD can improve the way it communicates with industry to reach and engage a broader and more diverse audience of potential suppliers, thereby ensuring that the warfighter has access to the cutting-edge technologies necessary to fight and win.

## How the DoD Markets Requirements: Federal Acquisition Regulation

The primary ways in which the DoD markets requirements and conducts supplier outreach in the procurement process are dictated by Federal Acquisition Regulation (FAR). These regulations create a set of rules that government stakeholders must comply with when procuring products and services. Certain exceptions exist within contract administration that allow contracting personnel to employ non-FAR contract strategies, such as Other Transactions, Procurements for Experiments, and Research and Development (R&D) Agreements (Defense Acquisition University, n.d.). However, the majority of contracts are FAR based, and non-FAR contracts are not always precluded from the marketing-specific requirements most relevant to this research.

For the purposes of this research, it is important to understand FAR Part 5, Part 6, and Part 10. FAR Part 5 requires contracting officers to "disseminate information on proposed contract actions ... expected to exceed \$25,000, by synopsis in the Governmentwide Point of Entry (GPE)" (FAR 5.1, 2021). The website <https://beta.sam.gov> (hereafter referred to as *beta.sam*), which replaced legacy site FedBizOpps in 2019, serves as the GPE. Thus, to comply with the FAR, all contract actions are made public on beta.sam, and the archived and active data on the site serves as a primary resource for our quantitative analyses. FAR Part 6 requires "with certain limited exceptions, that contracting officers shall promote and provide for full and open competition in soliciting offers and awarding Government contracts" (FAR 6.1, 2021) and

contracting officers shall provide for full and open competition through use of the competitive procedure(s) contained in [the FAR] subpart that are best suited to the circumstances of the contract action and consistent with the need to fulfill the Government's requirements efficiently. (FAR 6.1, 2021)



In short, FAR Part 6 requires government stakeholders to ensure that opportunities are marketed competitively.

Additionally, and of particular import, FAR Part 10 explicitly addresses the “policies and procedures for conducting market research to arrive at the most suitable approach to acquiring, distributing, and supporting supplies and services” (FAR 10, 2021). These policies dictate that government stakeholders must follow a number of steps during the market research process, including but not limited to the following:

- **Conduct market research appropriate to the circumstances-**
  - Before developing new requirements documents for an acquisition by that agency; ...
  - On an ongoing basis, take advantage (to the maximum extent practicable) of commercially available market research methods in order to effectively identify the capabilities of small businesses and new entrants into Federal contracting that are available in the marketplace for meeting the requirements of the agency.
- **Use the results of market research to-**
  - Determine if sources capable of satisfying the agency’s requirements exist;
  - Determine if commercial items or, to the extent commercial items suitable to meet the agency’s needs are not available, nondevelopmental items are available that-
    - Meet the agency’s requirements;
    - Could be modified to meet the agency’s requirements; or
    - Could meet the agency’s requirements if those requirements were modified to a reasonable extent;
  - Determine the extent to which commercial items or nondevelopmental items could be incorporated at the component level; ...
- **When conducting market research, agencies should not request potential sources to submit more than the minimum information necessary. (FAR 10, 2021)**

While the intention of these and other FAR clauses may be to foster competition, we sought to analyze, in practical terms, the extent to which these objectives are met. Furthermore, the importance of broadly marketing requirements and fostering healthy competition go beyond regulatory requirements. As we mentioned previously, now more than ever, the military needs innovative capabilities originating outside of the DIB, yet the DoD has continued to fall short in the critical mission of engaging these types of firms. This trend has persisted in spite of the FAR requirements and in spite of substantial investments into defense-sponsored innovation initiatives.

## Discoverability

### Beta.Sam Awareness

In our 2020 research, we argued that one reason why legacy contractors continue to receive the vast majority of DoD contracts is because there is a general lack of awareness among companies outside of the DIB on the basics of how to identify and engage with military customers (Bresler & Bresler, 2020). While the majority of this paper is concerned with whether or not specific features of DoD opportunities inhibit the military’s ability to engage nontraditionals, it is first important to consider whether or not nontraditionals can discover DoD opportunities at all. Simply put, are nontraditionals aware of beta.sam, and do they know how to leverage it to identify prospective opportunities?

We do not have access to information about website traffic to beta.sam, precluding us from quantitatively assessing the reach and composition of the site’s audience. However, we



can tell from site embeddings that the government does track critical data, such as overall site traffic, the number of unique visitors, the locations of visitors, and more. We encourage the DoD to make use of this information to assess the effectiveness of its marketing initiatives and to shape the development of future marketing and search engine optimization (SEO) strategies.

In the absence of site traffic data, we nevertheless have reason to believe that many nontraditionals are unfamiliar with beta.sam and/or struggle to navigate it. For instance, in addition to the multibillion dollar lobbying and consulting industry centered around helping firms navigate the defense market, companies such as GovWin, Bloomberg Government, and GovShop charge firms a subscription fee in exchange for repackaged opportunity data from beta.sam. The existence of a secondary market for publicly available government opportunity data suggests that beta.sam fails to serve as a viable resource for this information. The result of this “pay to play” paradigm is that the DoD does not see companies with the most cutting-edge capabilities. Rather, the military’s requirements primarily reach only those companies willing to pay for access. While service providers and relationships will always play a role in navigating an organization as large and bureaucratic as the DoD, it is important that basic information about the military’s requirements be accessible to a wide and diverse audience.

While the remainder of our analyses make the assumption that nontraditionals can successfully reach beta.sam, there is clearly a need to market the site better overall. Further research is required to determine the appropriate level of investment the DoD should make to broaden awareness of the site, along with how to allocate those resources. For starters, we suggest that they invest in SEO to ensure that beta.sam is returned at the top of all search engine searches for queries related to selling products/services to the government. Additionally, we suggest that the DoD engage a marketing firm to develop a strategy for promoting the site in places heavily trafficked by nontraditionals, like *Bloomberg Businessweek*, *Crunchbase*, *LinkedIn*, *The Wall Street Journal*, and more.

### Site Design

Assuming companies successfully reach beta.sam to explore potential DoD opportunities, they face yet another obstacle: how to navigate the site. It is clear from the landing page, a snapshot of which is provided in Figure 1, that it is not designed with supplier outreach in mind. Rather, it explicitly states that it is “for people who make, receive, and manage federal awards” (General Services Administration, n.d.). These distinct stakeholder groups have markedly different purposes for visiting the site and have markedly different levels of familiarity with government data and terminology.



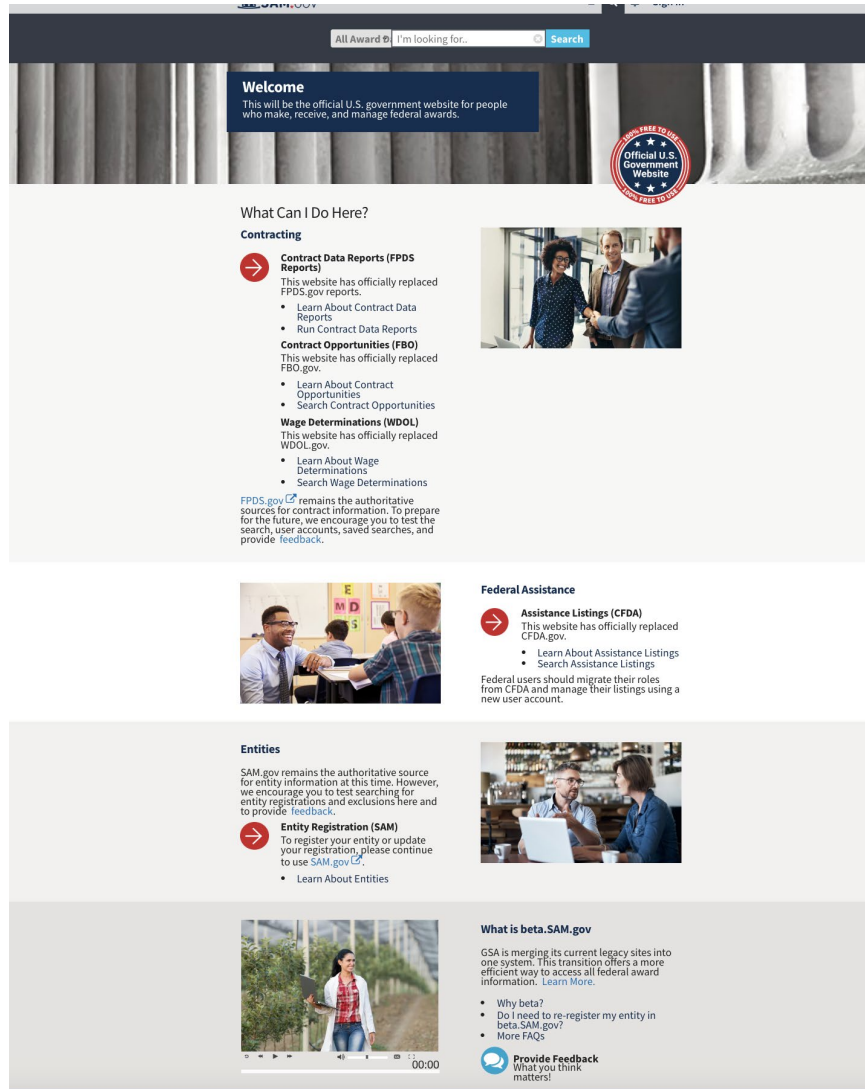


Figure 1. Beta.Sam Landing Page

Nontraditional face an immediate challenge of trying to decipher the wide array of links and drop-down menu options to determine what content is relevant to them. References to topics such as “Wage Determinations” and “Contract Data Reports” confuse and intimidate companies unfamiliar with the government market. Furthermore, there is no explicit call to action on the homepage for companies interested in learning more about selling their products/services to the government—only a drop-down menu that allows a user to select “Contract Opportunities” and small text towards the bottom of the page that says “Learn More” followed by “Contract Opportunities (FBO).”

Rather than relying on a single site to serve multiple distinct stakeholder groups, we recommend that the federal government create a separate site specifically for suppliers. The site would speak directly to prospective and current suppliers using simple, clear, and straightforward language. It could be linked to the “New Supplier Portal” we recommended in our 2020 research paper—a resource specifically for companies with no prior experience selling to the government (Bresler & Bresler, 2020). There would be a prominent search feature with an explicit call to action to the effect of “Interested in Selling Your Products/Services to the



Government? Search for Open Opportunities Here.” Additionally, we suggest that investments made by the DoD to market beta.sam be specifically focused on marketing this offshoot, supplier-specific site.

### **Search Functionality**

If and when users reach the landing page associated with “Contract Opportunities,” they can input keywords to conduct Boolean searches for relevant opportunities. Two significant limitations to this search functionality include:

- When inputting a search term, beta.sam only returns matches that reference the exact term searched; it does not stem the search term to generate matches for related terms. For instance, if a company searches “UAV,” they will not see matches for “drone” (unless the “drone” opportunity also contains the term UAV). As it stands, the scope of relevant opportunities presented to a company is substantially limited, which in turn limits the pool of prospective suppliers that participate in a given DoD opportunity. We recommend that the federal government at large, including the DoD, incorporate related terms to beta.sam’s search function. They can leverage resources such as the Defense Technical Information Center (DTIC) thesaurus to do so in a consistent fashion.
- Beta.sam only searches for the input term in the title and description of that opportunity—it does not search for the term in the attachment data. DoD customers often outline their needs in attachments rather than in the description, particularly in calls for market research. As it stands, companies who rely solely on beta.sam searches miss out on many potentially viable opportunities. We recommend that the DoD either mandate stakeholders to outline their needs areas in the description field or enable queries to search attachment data.

Of note, identifying too many opportunities can also be problematic, so it is important that the opportunities presented are easy to assess and understand. These nuances are addressed in greater detail in the Readability and Redundancy sections below.

### **Response Time**

Acknowledging that a lack of awareness of beta.sam, coupled with challenges posed by the design of the site, greatly inhibit the DoD’s ability to reach a broad audience, we now shift our focus to assess the features of DoD opportunities. These analyses make the assumption that companies know beta.sam exists and are using it to search for potential DoD opportunities. The first feature we explored is the length of time a company has to prepare and submit a response from when an opportunity is made public to when submissions are due. Response time is an important metric for competitiveness because companies need adequate time to identify an opportunity, to evaluate whether the opportunity is worth pursuing, and to prepare and submit a compliant response.

To quantitatively analyze the response time frames associated with DoD solicitations, we aggregated the archived solicitation data from beta.sam in each year from 2002 through 2020, starting in 2002 because the data sets become more complete in that year. After joining and cleaning 18 years’ worth of data, we filtered the data to isolate solicitations issued by the DoD. To ensure we counted only distinct solicitations, we also filtered the data to include just the most recent solicitation listing associated with a particular solicitation identification (solicitation ID) and title. Additionally, we excluded solicitations that contained no text in the name or the solicitation description and/or listed a response date that occurred prior to the publishing date.

We also excluded





- Solicitations associated with notice types for “Sale of Surplus Property,” “Modification/Amendment/Cancel,” and “Foreign Government Standard”
- “Award Only” notices
- “Justifications”

We excluded these listings because they contain features inconsistent with the majority of the data and are generally unrelated to the market research process.

Our resulting data set of total DoD solicitations for analysis was 1,050,933. Figure 2 shows the total number of DoD solicitations by year.

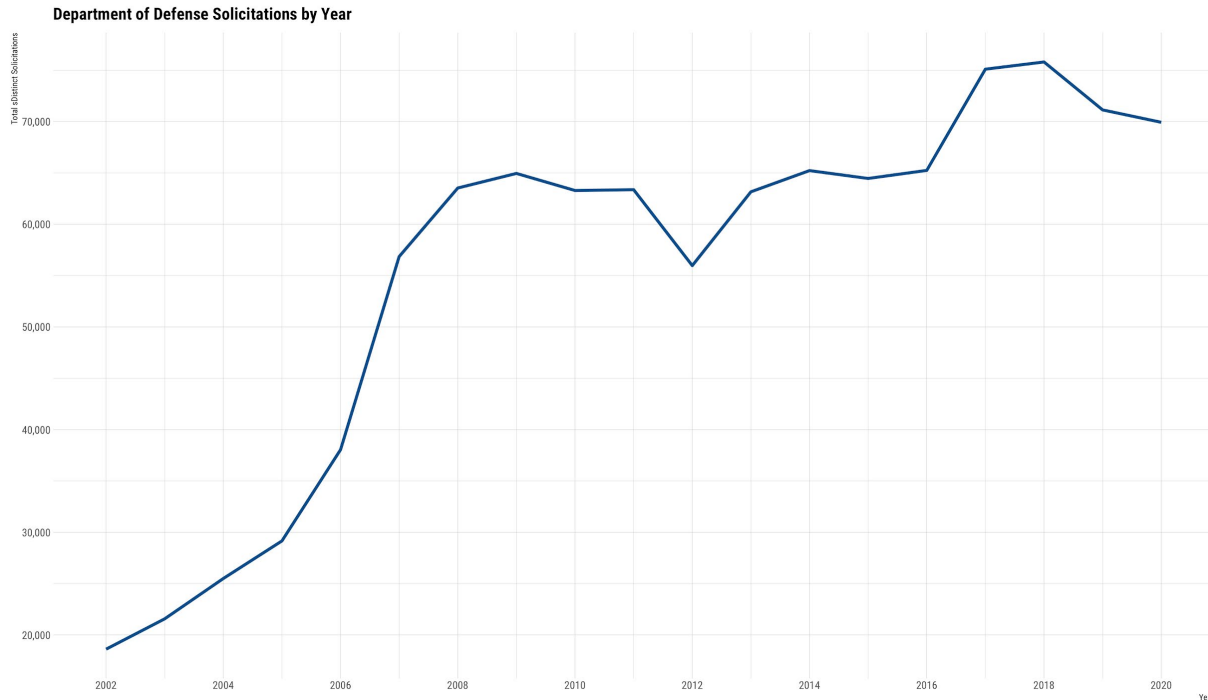


Figure 2. Total DoD Solicitations by Year

We then determined the response time frame for each solicitation by calculating the number of days between the date the solicitation was published and the date by which a response was due, both of which are standard data fields. As shown in Figure 3, every year from 2002 through 2020, 22% to 35% of all DoD solicitations had a response time of 10 days or less, and 45% to 87% of all DoD solicitations had a response time of 21 days or less. In each year over the last decade, 70% or more of all DoD solicitations had a response time of 21 days or less; and with the exception of 2020, at least 30% of all solicitations annually required responses within 10 days.



Department of Defense Solicitation Response Time by Year						
Year	Total Distinct Solicitations	Count Response Time <= 10 Days	Count Response Time 11-21 Days	% Response Time <= 10 Days	% Response Time 11-21 Days	% Response Time <= 21 Days
2002	18,612	4,255	4,487	22.86%	24.11%	46.97%
2003	21,569	4,818	4,994	22.34%	23.15%	45.49%
2004	25,496	5,742	6,289	22.52%	24.67%	47.19%
2005	29,157	6,915	9,734	23.72%	33.38%	57.10%
2006	38,042	9,793	15,905	25.74%	41.81%	67.55%
2007	56,854	14,783	26,043	26.00%	45.81%	71.81%
2008	63,532	15,918	28,197	25.06%	44.38%	69.44%
2009	64,953	19,384	26,445	29.84%	40.71%	70.56%
2010	63,289	19,501	26,483	30.81%	41.84%	72.66%
2011	63,368	18,804	28,692	29.67%	45.28%	74.95%
2012	55,975	16,212	26,666	28.96%	47.64%	76.60%
2013	63,162	18,656	31,058	29.54%	49.17%	78.71%
2014	65,229	22,079	31,486	33.85%	48.27%	82.12%
2015	64,462	22,288	28,515	34.58%	44.24%	78.81%
2016	65,248	23,126	29,963	35.44%	45.92%	81.36%
2017	75,106	25,152	35,897	33.49%	47.80%	81.28%
2018	75,808	26,460	33,793	34.90%	44.58%	79.48%
2019	71,139	23,218	30,287	32.64%	42.57%	75.21%
2020	69,933	18,533	42,253	26.50%	60.42%	86.92%

Figure 3. DoD Solicitation Response Time by Year

While these turnaround times may not violate the FAR, it is unreasonable to expect that companies with little or no experience in the public sector will have ample time to participate in the market research process for opportunities open 21 days or less, and a time frame of 10 days or less is that much more challenging. Furthermore, as the data show, the problem has become progressively worse over the last 2 decades. This trend is especially concerning since, over that same time frame, the military has become increasingly reliant on technologies being developed outside of the traditional DIB. In other words, as the need to engage nontraditionals has grown, the process for companies to do so has become more anticompetitive.

### Response Time by Notice Type

According to the DoD *Guidebook for Publicizing Notices in Contract Opportunities*, government stakeholders are required to publish notices for “proposed contract actions valued at more than \$25,000,” which include “announcements through official solicitations in the pre-award process, and up through award” (DoD, 2020, p. 3). As such, each opportunity corresponds to a specific notice type, depending on the purpose of the particular contract action. Each of the 1,050,933 opportunities in our data set corresponded to one of the following notice types, as defined by the *Guidebook for Publicizing Notices in Contract Opportunities* (DoD, 2020, p. 5):

- **Special Notice:** To increase competition and broaden industry participation, a special notice may be used to announce small business conferences, business fairs, long-range procurement estimates, pre-bid or preproposal conferences, meetings, and the availability of draft solicitations or draft specifications for review.
- **Sources Sought:** Use the sources sought notice type for Requests for Information (RFI) and other types of market research. An RFI is used when the Government does not presently intend to award a contract, but wants to obtain price, delivery, other market information, or capabilities for planning purposes. Responses are information only and shall not be used as an offer or proposal.



- **Presolicitation:** In appropriate cases, use a presolicitation notice to advise suppliers on the scope and purpose of the acquisition and to invite potential offerors to submit information. This allows the Government to advise the offerors about their potential to be viable competitors. Responses are information only and shall not be used as an offer or proposal. The FAR requires that a presolicitation notice be published in advance of a solicitation notice unless the combined synopsis/solicitation is used.
- **Solicitation:** Requests for proposals (RFPs) are used in negotiated acquisitions to communicate Government requirements to prospective contractors and to solicit proposals.
- **Combined Synopsis:** Use a combined Synopsis/Solicitation when the procurement meets the applicable conditions outlined in the FAR to reduce the time required to solicit and award contracts for the acquisition of commercial items. This notice type combines the synopsis and the issuance of the solicitation into a single document.

The purpose of Special Notices, Sources Sought, and Presolicitations is to allow the DoD to collect information from a broad range of suppliers about what capabilities they possess and how they would approach solving the DoD’s stated problem(s). The DoD then uses the feedback gathered to shape and inform future requirements. It is especially important that nontraditionals participate in these types of information exchanges. Otherwise, the military’s view of how problems can be solved is shaped exclusively by entrenched suppliers, which is inherently limiting as they do not always possess the most cutting-edge capabilities and may not be incentivized to encourage the DoD to consider new approaches. As such, we were interested in understanding how response times varied across these different notice types, and—in particular—for Special Notices, Sources Sought, and Presolicitations.

As shown in Figures 4 and 5, the vast majority of Special Notices and Sources Sought, and nearly half of all Presolicitations, have a turnaround of 21 days or less. Based on response time alone, suppliers unfamiliar with the DoD’s supplier outreach methods are effectively closed off from participating in these critical calls for market research.

**Department of Defense Solicitations, by Notice Type and Response Time**

Notice Type	Count Response Time <= 10 Days	Count Response Time 11-21 Days	Count Response Over 21 Days
COMBINED SYNOPSIS/SOLICITATION	197,454	332,578	35,559
PRESOLICITATION	72,472	99,069	208,678
SOURCES SOUGHT	32,431	28,144	18,857
SPECIAL NOTICE	10,818	5,444	2,564
SOLICITATION	2,462	1,952	2,452

Figure 4. Response Time by Notice Type



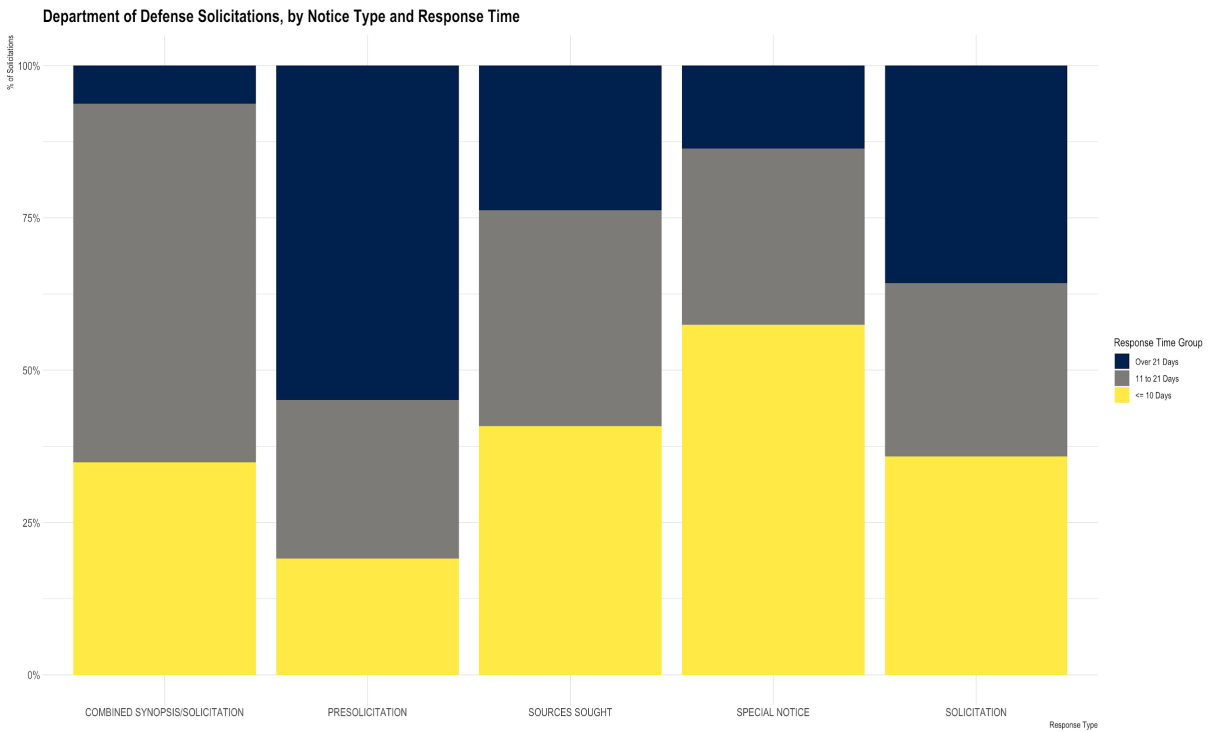


Figure 5. Percentage of DoD Solicitations, by Response Time and Notice Type

While technically speaking, the DoD may comply with FAR Parts 5 and 6 by making these opportunities public, one could argue they fail to meet the objective of FAR Part 10 by virtue of these short turnaround times. Furthermore, DoD opportunities with aggressively short turnaround times are often referred to in industry as “wired” (Walinskas, 2017). A wired opportunity is one where the customer has already identified its vendor, and the formal bid process exists only for compliance purposes. The odds of another supplier winning a future contract are effectively zero.

We recognize the importance of DoD stakeholders being able to engage with suppliers swiftly—in fact, allowing companies to contract quickly is critical for attracting innovators. However, the volume of opportunities with anticompetitive turnaround times indicates a disconnect between the intent of the regulatory standards and how they are employed in practice. To the extent that DoD stakeholders are making opportunities public for 21 days or less as a loophole to award contracts to suppliers they have already identified illustrates that there is a need to allow DoD stakeholders the ability to quickly engage certain suppliers, without doing so at the expense of the military’s overall marketing and outreach strategies. Specifically, we recommend that DoD stakeholders be required to make solicitations active for at least 30 days or be able to formally justify circumventing this requirement to bring a supplier on more quickly, similar to the use of sole-source justifications. If no such justification exists, a suitable response window—coupled with aggressively marketing the DoD requirements in general, as previously discussed—is essential to ensuring that the military has the ability to reach and engage nontraditionals.



## Content

### Readability: Reading-Ease & Grade Level

In order to ensure fair competition, opportunities not only need a reasonable response time but also must be written clearly so that potential suppliers can understand the requirements. Directly to this point, we sought to evaluate the content of DoD solicitations to determine the extent to which they are readable and easily understood by a wide audience.

To do so, we utilized the Flesch–Kincaid (F–K) readability tests. The two F–K tests, the F–K Reading-Ease test and the F–K Grade Level test, weigh features such as total words, total sentences, and total syllables to indicate how difficult a passage is to understand (“Flesch–Kincaid readability tests,” n.d.). For the F–K Reading-Ease test, a low score indicates that a passage is difficult to read, while a high score indicates that a text is easier to read. The F–K Grade Level test scores text based on U.S. grade levels or the number of years of education generally required to understand the text. The scores correspond to one another, insofar as text that is classified as “Difficult to Read” is equivalent to the “College” grade level, “Very Difficult to Read” is equivalent to “College Graduate” grade level, and so forth. Figure 6 lists each F–K Readability Group and its corresponding F–K Grade Level.

To calculate the F–K scores of the 1,050,933 solicitations in our data set, we assessed the text contained in each solicitation description. As shown in Figure 6, which presents the breakdown of the solicitations by F–K Reading-Ease and Grade Level, the majority of solicitation descriptions analyzed were “Difficult” or “Very Difficult” to read. Nearly 59% of all solicitations require some college-level education, and another nearly 20% of solicitations are suited for individuals that graduated from college. By comparison, fewer than 3% of solicitations are written in plain English.

Department of Defense Solicitations, Scored by Reading-Ease & Grade Level			
Flesch Readability Group	Flesch-Kincaid Grade Level	Total Solicitations	% of Total Solicitations
DIFFICULT TO READ	COLLEGE	617,516	58.76%
VERY DIFFICULT - READABLE COLLEGE GRADUATES	COLLEGE GRADUATE	209,471	19.93%
FAIRLY DIFFICULT TO READ	10TH TO 12TH GRADE LEVEL	124,176	11.82%
PLAIN ENGLISH - READABLE 13-15	8TH & 9TH GRADE LEVEL	24,111	2.29%
EXTREMELY DIFFICULT - READABLE DOMAIN EXPERTS	DOMAIN EXPERT	23,933	2.28%
EXTREMELY DIFFICULT - READABLE COLLEGE GRADUATES	PROFESSIONAL	18,825	1.79%
FAIRLY EASY TO READ	7TH GRADE LEVEL	17,950	1.71%
EASY TO READ - CONVERSATIONAL ENGLISH	6TH GRADE LEVEL	8,440	0.80%
EASY TO READ - READABLE UNDER 11	5TH GRADE LEVEL	3,834	0.36%
UNSCORED	UNSCORED	2,678	0.25%

Figure 6. DoD Solicitations, Scored by Reading-Ease and Grade Level

Figure 7 provides three examples of solicitation descriptions that were classified as “Difficult to Read,” according to the F–K test. They contain esoteric acronyms and range from including excessive information to including almost no information at all.



**Description** [View Changes](#)

3d Dental Battalion/USNDC Okinawa (3D DENBN/USNDC) has a requirement for Dental Implants used in patient treatment. This is a combined synopsis/solicitation prepared in accordance with FAR Subpart 12.6, as supplemented with additional information included in this notice. This announcement constitutes the only solicitation; quotations are being requested. The North American Industry Classification System (NAICS) code is 339114. This acquisition is non-restricted. The incorporated provisions and clauses are those in effect through Federal Acquisition Circular 05-38. The following provisions and clauses apply plus any addenda: FAR 52.212-1 Instructions to Offerors - Commercial Items; 52.212-2 Evaluation - Commercial Items; 52.212-3 Offeror Representations and Certifications --Commercial Items; 52.212-4 Contract Terms and Conditions - Commercial Items; and 52.212-5 Contract terms and Conditions to Implement Statutes or Executive Orders - Commercial Items. The requirements includes the following schedule of supplies: CLIN 0001, BF 12 (12 HOWARD BONE FILE) QTY 8; UNIT PRICE \_\_\_\_\_, CLIN 0002, CM18 (#18 MCFARLAND BI BEVEL CHISEL) QTY 2; UNIT PRICE \_\_\_\_\_, CLIN 0003, E77 (SERRATED ELEVATOR #77) QTY 40; UNIT PRICE \_\_\_\_\_, CLIN 0004, F150K (150 PEDODONTIC FORCEPS) QTY 15; UNIT PRICE \_\_\_\_\_, CLIN 0005, F151K (151K PEDODONTIC FORCEPS) QTY 15; UNIT PRICE \_\_\_\_\_, CLIN 0006, F17 (#17 HARRIS FORCEPS) QTY 13; UNIT PRICE \_\_\_\_\_, CLIN 0007, FAF150 (APICAL FORCEPS 150) QTY 15; UNIT PRICE \_\_\_\_\_, CLIN 0008, FAF151 (APICAL FORCEPS 1514) QTY 28; UNIT PRICE \_\_\_\_\_, CLIN 0009, FAF74N (74N EUROPEAN STYLE APICAL FORCEPS) QTY 12; UNIT PRICE \_\_\_\_\_, CLIN 0010, FX13 (#17 EUROPEAN STYLE FORCEP TOOTH EXTRACT) QTY 15; UNIT PRICE \_\_\_\_\_, CLIN 0011, R4A QTY 36; (4A CLEVELAND RONGEURS) UNIT PRICE \_\_\_\_\_, F.O.B. Destination pricing requested, the contractor shall include the price of shipping into the cost of each CLIN. The contractor shall accept fax or emailed prescriptions from 3D DENBN/USNDC to be filled. Delivery and acceptance point shall be US Naval Hospital Okinawa, PSC 482 BOX 248, FPO AP 96362-1695 seven days after receipt of order. The Government will award a Firm-Fixed Price (FFP) contract resulting from this combined synopsis/solicitation to the responsible contractor whose quote conforming to the solicitation will be most advantageous to the Government, price and other factors considered. The following factors shall be used to evaluate offers: (1) Technical capability of the item quoted to meet the Government requirement (including submission of descriptive literature); (2) Past Performance and (3) Price; (4) Delivery; all to be submitted with quotation. Contractors are responsible for obtaining any and all amendments or additional information. Quotes and all pertinent data (descriptive literature, specifications, etc.) must be received by March 10, 2010 at 0900 (9:00 a.m. Japan Standard Time (JST)). Include company name, point of contact, address, phone number, Duns Number, CAGE Code, and Tax ID. As a basis for contract award, contractors must be registered with Central Contractor Registration. [Note: Lack of registration in the Central Contractor Registration will make a Contractor ineligible for award] Registration is available via the Internet at www.ccr.gov. Responses shall be submitted via e-mail in Word, Excel, or PDF format to the POC, Yumi Robb, at yumi.robb@med.navy.mil or faxed to 011-81-989-92-8575. Telephone inquiries or requests will not be accepted.

**Description** [View Changes](#)

The purpose of this announcement is to provide notification of upcoming Industry Days for a potential Cockpit Selectable Output Weapon (SOW) Future Naval Capability (FNC) Broad Agency Announcement (BAA). Industry day discussions and the potential BAA will be limited to technology development in the area of warheads, bombs, kill mechanisms and damage mechanisms. The intent of the potential BAA would not be to improve or develop new weapon to aircraft interfaces, or sensors, or guidance, or control systems. The Naval Air Weapons Center Weapons Division (NAWCWD) will host Industry Days for the potential SOW FNC at the Naval Air Weapons Station Conference Center on 2 March 2010 thru 4 March 2010 in China Lake, CA. The primary purpose of this event is to provide information to industry on the status of NAWCWD's SOW efforts and current planned path forward after review of responses to the Request for Information N6893609R0015. NOTES: 1. The Government does not plan to hold Industry Days at any other geographic location at this time. 2. If you have access to JPAS, the SMO Code is 605306 and the POC is Linda Chambliss (760-939-2412). In order to receive the necessary badges and attend industry day, each participant's full name, company affiliation, social security number (last four digits, date and place of birth must also be sent to Celeste Moore (celeste.moore@navy.mil, phone: 760-939-5979, fax: 760-939-7190) by close of business February 16, 2010. The email, fax or phone call should also indicate if the participant is a U.S. citizen. 3. If the visitor does not have access to JPAS, a copy of the visitor's security clearance should be sent to Linda Chambliss (phone: 760-939-2412, fax: 760-939-0306). In order to receive the necessary badges and attend industry day, each participant's full name, company affiliation, full social security number, date and place of birth must also be sent to Celeste Moore (celeste.moore@navy.mil, phone: 760-939-5979, fax: 760-939-7190) by close of business February 16, 2010. The email, fax or phone call should also indicate if the participant is a U.S. citizen. 4. If the visitor does not have a security clearance, the visitor's full name, company affiliation, full social security number, date and place of birth must be sent to Celeste Moore (celeste.moore@navy.mil, phone: 760-939-5979, fax: 760-939-7190) by close of business February 16, 2010. The email, fax or phone call should also indicate if the participant is a U.S. citizen. 5. Attendance is limited to DOD Personnel and DOD contractors only. 6. Attendance is limited to two (2) representatives per company. 7. Attendance is limited to U.S. citizens only. 8. Contact Celeste Moore (760-939-5979) to schedule a meeting between Individual Contractor Teams and the Government. The individual meetings should last less than 1 hour each. Industry Days Program (subject to change): 2 March 2010: 8:00 am - 8:30 am Welcome, Introductions, Meeting Objectives, Meeting Guidelines; 8:30 am - 9:30 am Update on NAWCWD & ONR SOW efforts; 9:30 am - 9:40 am Break; 9:40 am - 11:00 am SOW FNC Status; 11:00 am - 1:00 pm Lunch (On your own); 1:00 pm - 4:30 pm Meetings between Individual Contractor Teams and Government; 3 March 2010: 8:00 am - 11:00 am Meetings between Individual Contractor Teams and Government (continued); 11:00 am - 1:00 pm Lunch (On your own); 1:00 pm - 4:30 Meetings between Individual Contractor Teams and Government (continued); 4 March 2010: 8:00 am - 11:00 am Meetings between Individual Contractor Teams and Government (continued); 11:00 am - 1:00 pm Lunch (On your own); 1:00 pm - 4:30 Meetings between Individual Contractor Teams and Government (continued); Questions and Answers Q: Does the two-person per company restriction apply to the Contractor/Government sidebars as well? A: Yes. Q: Can teammates be in the sidebar meeting with Government members? A: Yes however, teammates are considered part of the two-person per company restriction. NOTE: All requirements for attendance still apply.

**Description**

Call for White Paper under Broad Agency Announcement W911NF-17-S-0003, Topic 6; Human Sciences Campaign, subtopic f: CCE-HS-3 Training.

Figure 7. Sample "Difficult to Read" Solicitation Descriptions

To attract a broad audience, requirements must be written in concise, accessible language. Requirements that consist of complex, incomprehensible language limit competition because companies become frustrated by the challenges and effort needed to decipher the text. Furthermore, these poorly written requirements run contrary to the DoD Plain Writing Act of 2010. The act requires federal agencies to write "clear Government communication that the public can understand and use" and stipulates guidelines for compliance that require the DoD to write new documents in "plain language" (Washington Headquarters Services, n.d.).

We recommend that the DoD require all solicitation descriptions to be written in plain English, suitable for an 8th- to 9th-grade reading level. To implement this policy, the government can incorporate a feature on the back end of beta.sam that automatically reads the text of every new solicitation inputted by a DoD stakeholder and calculates its F-K scores. If the scores do not meet the recommended reading level, the system automatically recommends simpler replacement language that the stakeholder can review and approve. Only once the appropriate levels of readability are met can the solicitation be published. We also recommend that text on



all public-facing DoD websites, including beta.sam, as well as text in DoD collateral materials meant for public distribution, be written in plain English.

### **Readability: Supplier Feedback**

In addition to analyzing the readability tests on the 1,050,933 solicitations in our data set, we also surveyed 23 small businesses to gather their feedback on government solicitations. The 23 firms are nontraditional dual-use companies that are currently participants in the Air Force's Small Business Innovation Research (SBIR) program. For each company, we utilized publicly available information, including their SBIR award description and related keywords, to establish a basic understanding of their capabilities. We then identified opportunities via beta.sam that appeared to relate to their capabilities, shared the links to the relevant opportunities with a designated company point of contact using Survey Monkey, and asked them to offer feedback on each match. Because they are SBIR participants, they are inherently more familiar with navigating the DoD's solicitation processes than companies with no prior defense business, which would imply a greater comfort level with deciphering additional DoD opportunities presented to them. On the contrary, the companies were frustrated by how challenging it was to decipher the solicitations. Specific feedback included:

- "I cannot tell from the (Areas of Interest) (AOI) what they are asking"
- "I'm struggling mightily to find the AOIs that say what the DoD really wants."
- "Super annoying that I had to comb through attachments to find the AOI's topic."
- "(Broad Agency Announcements) (BAAs) are complex"
- "These BAAs take quite a while to go through and communicate."
- "That was SUPER painful ... because of the opacity with which those SAM postings are written. There are a couple—even AFTER downloading the documents from SAM—that remain mysterious."

To competitively attract and engage nontraditionals, opportunities must be written clearly and provide the detailed information necessary for a company to evaluate whether or not the opportunity is worth pursuing. The aforementioned feedback highlights another problem with the DoD's marketing and outreach methods: critical information is often buried in cumbersome attachments or omitted altogether. Having to sift through complex files to understand the requirements does not inspire a company to respond to a solicitation. Accordingly, in addition to ensuring that the description text of an opportunity is written in plain English, we also recommend that all opportunity descriptions explicitly state the customer's primary areas of interest.

### **Requisite Information**

By assessing the features of the data contained in our solicitation data set and reviewing publicly available opportunities on beta.sam, we found that the DoD often omits critical pieces of information from opportunity listings altogether. Specifically, there are no structured fields requiring DoD stakeholders to indicate on the landing page of beta.sam the value of the opportunity (estimated or actual) or the performance period (estimated or actual).

We recognize that providing specific contract values or performance periods for all notice types is a challenge for DoD stakeholders, because the market research process is intended to help shape the requirements. However, nontraditionals, especially those with robust private sector revenue streams, are unlikely to invest time and resources to explore an engagement with a DoD customer without some sense of the potential upside and/or when the work might begin.

We suggest that the DoD be required to provide an estimated contract value/range for all opportunities. An algorithmic approach can be employed to generate the estimates, including



aggregating and weighing factors such as average contract size awarded by the corresponding contracting office over the last 5 years; average contract size for the particular product or service the opportunity corresponds to (for instance, if the opportunity relates to drones, calculating the average size of drone contracts in DoD over the last 5 years); budget estimates for that particular product/service as provided by the Office of Management and Budget (OMB); and other related data points. The solicitation would state that the information provided is an estimate and subject to change. While the process for calculating the estimate requires further research and refinement, we believe it is essential for the DoD to invest in providing this data point as part of its marketing and communication efforts. Companies, particularly nontraditionals attempting to scale with limited resources, also need some sense of performance period to prioritize which opportunities to pursue. DoD stakeholders should, therefore, be required to provide an estimated period of performance as well.

## Redundancy

Another challenge that companies face when trying to prioritize DoD opportunities is that many of the same technologies are in high demand by stakeholders across all service branches. The DoD's 2020 modernization priorities, for example, emphasize the importance of "the development and procurement of high priority systems—such as artificial intelligence, directed energy, small satellites, hypersonics, a 5G network and unmanned aerial systems" (Vergun, 2020) for the whole of military.

For companies with applicable capabilities, a large addressable market may make investing in the defense sector more appealing. However, as discussed throughout this paper, to capitalize on the market, companies must have the ability to navigate it. In cases where multiple DoD stakeholders are seeking similar solutions ("redundancy"), the challenges we have highlighted are compounded by the fact that a company must identify and decipher the relevant opportunities and then decide which ones to pursue. To assess the scope of this redundancy problem, we sought to explore the extent to which multiple DoD stakeholders are simultaneously seeking capabilities related to two of the military's modernization priorities, unmanned aerial vehicles (UAVs) and artificial intelligence (AI).

## Redundancy Analysis

To calculate how many DoD solicitations corresponded to UAVs and/or AI, we employed a more computationally intensive approach that required us to utilize a smaller data set. We focused our analysis on a data set of 69,933 solicitations from the year 2020. Next, we leveraged the DTIC thesaurus to expand the set of terms we used to describe UAVs and AI. The DTIC thesaurus allows for the provision of an input term, such as "unmanned aerial vehicle," and returns a set of related keywords with varying degrees of proximity to the original term. For the purposes of this research, we limited the results to related terms, which can be understood as synonyms.<sup>1</sup> Next, we algorithmically searched for incidences of these terms in

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<sup>1</sup> Keyword Corpus: AI APPLICATIONS, AI COMPUTING, APPLIED COMPUTER SCIENCE, ARTIFICIAL INTELLIGENCE, ARTIFICIAL INTELLIGENCE COMPUTING, ARTIFICIAL INTELLIGENCE SOFTWARE COMPUTATIONAL PROCESSES, COMPUTER VISION, COUNTER-DRONE TECHNOLOGY, COUNTER-UAS COUNTER-UAV TECHNOLOGY, COUNTER-UNMANNED AERIAL SYSTEMS, DEEP LEARNING, DEEP STRUCTURED LEARNING, DRONE, DRONE CONTROL AIRCRAFT, DRONE SWARMS, DRONES, EXPERT SYSTEMS, HEAVY FUEL ENGINES, HEAVY FUEL UAV ENGINES, HIERARCHICAL LEARNING, INFERENCE ENGINES, INTELLIGENT PERSONAL ASSISTANTS, INTELLIGENT SYSTEMS, LAMP RAY ROV, MACHINE LEARNING, MACHINE PERCEPTION, MICRO AIR VEHICLE, NATURAL LANGUAGE PROCESSING, NATURAL LANGUAGE PROCESSING SOFTWARE, NEURAL NETWORKS, REMOTELY PILOTED AIRCRAFT, SEMI-SUPERVISED LEARNING, SMALL UNMANNED AIRCRAFT SYSTEM, SOFTWARE AGENTS, SUPERVISED LEARNING, SUPERVISED MACHINE LEARNING, SURVEILLANCE DRONES, SWARM INTELLIGENCE, SWARMING DRONES, SWARMING TECHNOLOGIES, SWARMS OF FIXED WING DRONES, TARGET DRONES,





the description, ID, and title for each solicitation. A matched term indicated that an opportunity corresponded to a UAV and/or AI requirement. With this methodology, we identified 42 DoD opportunities in 2020 that corresponded to UAVs and/or AI.

As previously discussed, the DoD often buries critical information, including the areas of interest, in attachments. To more accurately calculate the number of solicitations related to UAV/AI capabilities would, therefore, require searching for the terms in the attachment data. Solicitations can have dozens or even hundreds of pages of attachments across multiple files and file types, and because supporting documents are formatted inconsistently, it was not feasible to incorporate the text and data from attachments for all 69,933 solicitations. Instead, to enhance the search, we decided to incorporate a small subset of attachment data.

Specifically, we first filtered the data to isolate opportunities that corresponded to either a Sources Sought or a Broad Agency Announcement (BAA). While BAAs are not a specific notice type, they—like the DoD’s other methods of conducting market research—request “scientific or research proposals from private firms concerning certain areas of interest to the government” (AcqNotes, 2021) and may lead to contract awards. The DoD relies on BAAs to communicate with industry and gather critical market research. For instance, the DoD’s SBIR topics are issued as BAAs. To identify BAAs in our 2020 data set, we searched for the terms “Broad Agency Announcement” and “BAA” in the contract ID, solicitation name, and solicitation description. We then combined the BAAs with the opportunities corresponding to a Sources Sought notice type, excluding any Sources Sought that were already counted as BAAs. In total, we identified 2,519 opportunities in 2020 that were either Sources Sought or BAAs. For these 2,519 opportunities, we incorporated the text and data contained in their attachments and utilized optical character recognition (OCR) and other methods of text extraction to search this data for UAV/AI terms.

With this methodology, we identified an additional 22 DoD opportunities in 2020 that corresponded to UAVs and/or AI, bringing the total to 64. In other words, utilizing OCR and text-extraction on just 3.6% of the solicitation data increased the number of matched opportunities by more than 50%. Based on these results, one can assume that the total number of DoD stakeholders that posited demand for UAV/AI capabilities in 2020 was substantially more than 64.

### **Demand Outside of DoD**

Furthermore, our analyses did not include solicitations from federal stakeholders outside of the DoD. When assessing the challenges companies face in trying to prioritize DoD customers, it is worth considering the potential effects of demand from non-DoD customers—particularly because, with the beta.sam process, companies discover DoD and non-DoD opportunities simultaneously. We recommend further research to explore the DoD-level findings we have addressed in this paper across the entirety of government, and we recommend that this further research incorporate attachment data to the best extent possible.

In the interim, we conducted a microanalysis to explore the potential impact of non-DoD demand on our research results. To do so, we aggregated all open federal opportunities—DoD and non-DoD, including attachment data—from a single day—October 8, 2020—and searched

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UAS, UAV, UGV, UNDERWATER DRONES, UNINHABITED AIRCRAFT VEHICLE, UNMANNED AERIAL, UNMANNED AERIAL SYSTEMS, UNMANNED AERIAL VEHICLE, UNMANNED AEROSPACE VEHICLE, UNMANNED AIR SYSTEMS, UNMANNED AIRCRAFT, UNMANNED AIRCRAFT SYSTEMS, UNMANNED AIRCRAFT VEHICLE, UNMANNED GROUND SYSTEMS, UNMANNED GROUND VEHICLE, UNMANNED GROUND VEHICLE SYSTEMS, UNMANNED SYSTEMS, UNSUPERVISED LEARNING, UNSUPERVISED MACHINE LEARNING



for UAV terms across this data set. As shown in Figure 8, on that single day, 132 open opportunities corresponded to UAVs.

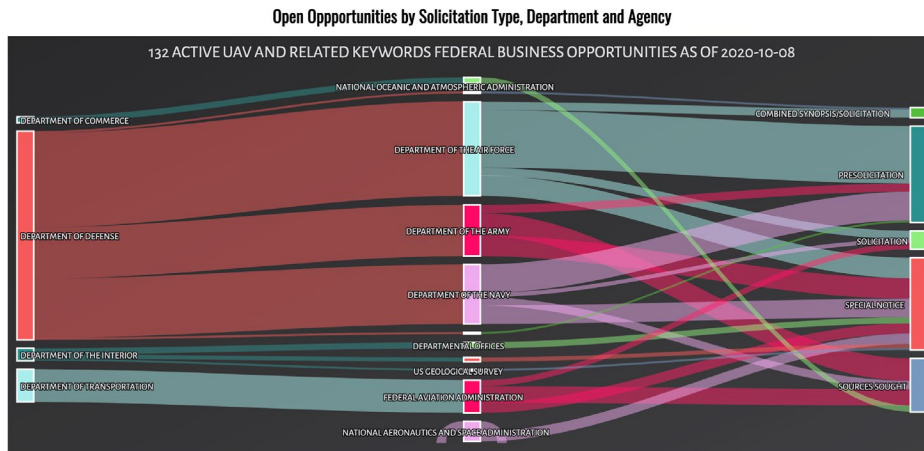


Figure 8. Open Solicitations Related to UAVs on October 8, 2020

Assessing redundancy using any one of the aforementioned methodologies, it is clear that companies with high-priority capabilities can encounter anywhere from dozens to hundreds of prospective DoD and non-DoD opportunities. Therefore, if and when a company identifies and deciphers relevant opportunities, realistically it cannot participate in all of them. The DoD’s failure to coordinate its outreach and communication efforts results in negative consequences for both nontraditionals and the warfighter. DoD customers only receive feedback from a small number of firms and are not guaranteed to receive feedback from firms with the most applicable capabilities. As a result, they have a myopic view of how their problems can be solved. Companies interested in serving the needs of government have to decide which customer(s) to engage with the information they have at hand. As a result, they are not necessarily choosing the customers whose use cases align most seamlessly with their capabilities, and they are not necessarily choosing the customers with the most urgent need for their capabilities.

Better intra-government communication would benefit the supplier and the government; thus, it is essential that military stakeholders coordinate their outreach and communication efforts to maximize exposure of their requirements. For priority verticals, we recommend that DoD stakeholders issue joint requirements in the market research/outreach phases. Further research is required to determine the best way to implement this concept, including how to appropriately incentivize DoD stakeholders to take the necessary actions. We suggest that prior to release, the DoD circulate requirements related to priority verticals to designated offices within each service branch. This action will allow DoD stakeholders to incorporate related requirements into the solicitation. In addition to helping the DoD gather information from a wider range of potential suppliers and steer them in different directions more effectively, this approach would allow companies to market their capabilities to multiple prospective customers simultaneously—a major advantage over the current stovepiped system.

## Conclusion

In spite of billions in investment for innovation initiatives and unremitting rhetoric from senior leadership about the DoD’s commitment to a culture of innovation, our 2020 research proved that the military has failed to attract and engage a significant number of new suppliers over the last decade, which puts the warfighter at risk (Bresler & Bresler, 2020). In this paper, we employed qualitative and quantitative research techniques to illustrate that *how* and *where*



the DoD communicates with industry have contributed to this problem. We identified a series of conditions that must be met in order for the DoD's requirements and messaging to reach suppliers outside of the traditional DIB:

- Companies need to know where to go to search for DoD opportunities, and the search process must be user-friendly and intuitive.
- Companies need enough time to identify, assess, and respond to an opportunity.
- Companies need to easily understand what DoD customers are asking for.
- To determine whether or not an opportunity is worth pursuing, companies need certain pieces of critical information, including the potential contract size.
- The DoD needs to coordinate its marketing and outreach efforts, especially for capabilities in high demand across the government.

The absence of any one of these conditions not only fails to meet the objective of the FAR but also creates a bottleneck that limits industry participation in the market research process. The military, in turn, operates with an incomplete picture of how its problems could be solved and what capabilities exist to solve them. The recommendations outlined throughout this paper are intended to help the DoD address each of these bottlenecks as efficiently as possible and to make the process of engaging with the military more seamless for nontraditionals accustomed to operating in the private sector. Ultimately, the military needs access to the best and brightest suppliers to preserve the strength of the warfighter—and to attract best suppliers, the DoD must behave like a better customer.

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