



To: Jeffery Brakebill, Contracting Officer, Office of Finance and Administration

From: Michael Kainu, COR for contract PSA17C0043, Office of Planning, Policy and Analysis

Date: February 8, 2019

Re: Contract Extension- PSA17C0043

Please consider this request for a no cost 60-day extension for contract PSA17C0043 with Maxarth, LLC, currently due to expire on March 6, 2019.

One of the major deliverables of this contract is support from Maxarth, LLC in implementing the revised Risk Assessment Instrument (RAI) into PSA's case management system, PRISM. While this contract PSA17C0043 was not affected by the shutdown, the OIT resources and government oversight required for the implementation were not available during that time. As a result, this deliverable was put on hold. Further, the shutdown delayed other IT projects which in turn have delayed our access to OIT resources for this implementation.

Therefore, in order to complete tasks associated with this contract, we are requesting a no cost 60-day extension for PSA17C0043 until May 5, 2019. Thank you for your assistance in this matter, and please let us know of any additional information you need.

CC: Hala Maktabi, Director, Office of Planning Policy and Analysis
Rachel Dobbs, Contract Specialist, Office of Finance and Administration
Geraldine Decembre, Special Assistant, Office of the Director

MEMORANDUM FOR RECORD
Modification 959P0017C0043P00001

This memorandum provides the documentation necessary to support modification P00001 to contract number 959P0017C0043, issued to Maxarth, LLC.

BACKGROUND

On September 7, 2017, PSA issued contract number PSA17C0043 as an SBA Section 8(a) Direct Award to Maxarth LLC for the purpose of conducting a Risk Assessment Revalidation Study. The performance period for this risk assessment was from September 7, 2017 through September 6, 2018. As a result of this study, significant enhancements to the risk assessment tool were identified which require recalibration of the tool in PSA's client management system. These enhancements include addition of new predictive factors, elimination of others, and recalculation of risk scores. Given the high reliance of judicial officers on PSAs risk assessment tool for their decision-making, and the technical complexity of implementing these enhancements, PSA determined additional assistance was required from the contractor for implementation. PSA IGE for these services is [REDACTED]. Funding in this amount was provided on requisition number PSA180303.

On August 31, 2018, Maxarth was approached to provide a price proposal for the additional services required to implement the changes. Maxarth provided response later the same day. In the initial proposal, Maxarth outlined their understanding of the work required as well as a fixed price proposal for completing the work. A copy of the contractor's proposal was forwarded to the program office for review and concurrence of the contractor's understanding and technical approach. The initial cost proposal came in at [REDACTED]. Pending technical review, the contracting officer requested a budget ceiling which could be used during price negotiations. A budget ceiling was set at [REDACTED].

On September 4, 2018, the program office advised that the technical review was complete and that the contractor's understanding and approach were acceptable. The Contracting Officer then opened negotiations with the contractor. The target (objective) of approximately [REDACTED]. The final negotiated price for services was agreed at [REDACTED].

PURPOSE OF MODIFICATION

The purpose of modification P00001 is to modify contract number PSA17C0043 to include the additional in-scope work. In consideration for the additional services, the contract performance period will be extended by 6 months and the amount of the contract will be increased by [REDACTED].

AUTHORITY

FAR 52.212-4(c), Changes

PREPARED BY

Jeffery C.
Brakebill


Digitally signed by Jeffery C.
Brakebill
Date: 2018.09.05 07:40:15
-04'00'

September 5, 2018

Jeffery C. Brakebill
Contracting Officer

**SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS
OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30**

1. REQUISITION NUMBER PSA170218	PAGE 1 OF 47
5. SOLICITATION NUMBER PSA17Q0034	6. SOLICITATION ISSUE DATE 08/07/2017
b. TELEPHONE NUMBER (No collect calls)	8. OFFER DUE DATE/ LOCAL TIME 2017-08-16T08:00:00.0

2. CONTRACT NO.	3. AWARD/EFFECTIVE DATE	4. ORDER NUMBER
7. FOR SOLICITATION INFORMATION CALL: 		
a. NAME Weiss, Diana T		

9. ISSUED BY PSA Pretrial Services Agency 633 Indiana Ave, NW, Suite 1134 Washington, DC, 20004, US	CODE 959P00	10. THIS ACQUISITION IS <input checked="" type="checkbox"/> UNRESTRICTED OR <input type="checkbox"/> SET ASIDE: 0 % FOR: <input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> WOMEN-OWNED SMALL BUSINESS (WOSB) <input type="checkbox"/> HUBZONE SMALL BUSINESS <input type="checkbox"/> ECONOMICALLY DISADVANTAGED WOMEN-OWNED SMALL BUSINESS (EDWOSB) <input type="checkbox"/> SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS <input type="checkbox"/> 8 (A)
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11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input checked="" type="checkbox"/> SEE SCHEDULE	12. DISCOUNT TERMS	13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) <input type="checkbox"/>	13b. RATING	14. METHOD OF SOLICITATION <input checked="" type="checkbox"/> RFQ <input type="checkbox"/> IFB <input type="checkbox"/> RFP
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15. DELIVER TO See Schedule	CODE	16. ADMINISTERED BY CODE
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17a. CONTRACTOR/OFFEROR Maxarth LLC 12215 Fellowship Lane, North Potomac, MD 20878 TELEPHONE NO. (301) 873-1898	CODE	FACILITY CODE	18a. PAYMENT WILL BE MADE BY CODE
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<input type="checkbox"/> 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER	18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED <input type="checkbox"/> SEE ADDENDUM
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19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	See Schedule			\$ 254,858.40	\$ 254,858.40
(Use Reverse and/or Attach Additional Sheets as Necessary)					

25. ACCOUNTING AND APPROPRIATION DATA See Schedule	26. TOTAL AWARD AMOUNT (For Govt. Use Only)
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<input type="checkbox"/> 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4. FAR 52.212-3 AND 52.212-5 ARE ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED	<input type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4. FAR 52.212-5 IS ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED
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<input checked="" type="checkbox"/> 28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED	<input type="checkbox"/> 29. AWARD OF CONTRACT: REF. _____ OFFER DATED _____. YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:
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30a. SIGNATURE OF OFFEROR/CONTRACTOR 	31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER)
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30b. NAME AND TITLE OF SIGNER (Type or print) Avinash Bhati, PhD President Maxarth LLC	30c. DATE SIGNED 08/15/2017	31b. NAME OF CONTRACTING OFFICER (Type or print)
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CREATIVE DATA AND ANALYTICAL SOLUTIONS

August 15, 2017

Diana T. Weiss

Contract Specialist

Pretrial Services Agency for DC

633 Indiana Avenue, N.W. Suite 1133

Washington, DC 20004

Dear Ms. Weiss:

Please find attached a proposal Maxarth LLC is submitting in response to solicitation PSA17Q0034 issued by the Pretrial Services Agency for the District of Columbia. Maxarth LLC is a Maryland-based data & analytics firm. We have been in operation since 2008 and have successfully conducted numerous projects of the size and scope PSA is seeking. We are a minority owned small business concern and Maxarth LLC was accepted into SBA's 8(a) program in July 2014. Maxarth LLC's corporate capabilities statement is attached to this proposal as an appendix.

Please do not hesitate to contact me if you need additional information about Maxarth LLC or this proposal. I look forward to hearing from you and working with PSA again.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Avinash Bhati", with a stylized flourish at the end.

Avinash Bhati, PhD

President Maxarth LLC

(301) 873-1898

abhati@maxarth.com

Pretrial Services Agency for the District of Columbia Risk Assessment Instrument Revalidation Study

Project Summary:

The Pretrial Services Agency for the District of Columbia is seeing to revalidate and enhance its risk assessment and recommendation protocols. The main goal of this project is to provide PSA consulting services in order to assist it in meeting three objectives:

1. Revalidate the existing instrument and revise the underlying weighting schemes by including, if needed, additional static and dynamic predictors;
2. Assess the adequacy of PSA's release conditions recommendation matrix and ensuring it aligns with the revalidated instrument; and
3. Ensuring that the risk assessment protocols used by PSA are not inadvertently biased against any groups (racial or socioeconomic).

Maxarth LLC is proposing to provide the needed service over a 12-month period. The project will rely heavily on data in PRISM—PSA's rich data warehouse—while leaving open the possibility of using data in additional sources. Given the related nature of the three objectives, the proposed project is split into a number of tasks that are organized to (i) maximize PSA staff and leadership input at early stages of the project, (ii) detailed presentations designed to solicit feedback during analysis, and (iii) final in-person presentations to explain study findings and recommendations. All analysis and recommendation will be documented in a final comprehensive report and the racial bias analysis will be documented in a social responsibility report.

Maxarth LLC will provide consulting services to PSA at the end of the project to ensure that the project recommendation and findings are implemented appropriately. The project is expected to result in a revalidated and revised risk assessment instrument that minimizes the chance of producing systematically biased predictions and a revised release condition recommendations matrix that is aligned with the risk assessment instrument.

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PURPOSE, GOALS, AND OBJECTIVES

The Pretrial Services Agency for the District of Columbia (PSA)—an independent entity within the Court Services and Offender Supervisions Agency for the District of Columbia (CSOSA)—developed, validated, and deployed a risk assessment instrument (RAI) in 2012. That instrument has improved PSA’s ability to identify defendants appropriate for release and those more suited for detention. On June 24, 2014, staff completed the 10,000th risk assessment using this instrument. In keeping with standard practice—revalidating actuarial instruments on a regular basis—PSA is in the process of revalidating the RAI and improving its functionality. In addition, PSA is interested in gauging the need to develop customized assessments for specialized sub-populations as well as in gauging the extent of inadvertent bias that might exist in their instrument’s recommendations. Maxarth LLC is pleased to submit this proposal in response to solicitation PSA17Q0034 issued by PSA for expert consulting services.

The main GOAL of this project is to provide PSA consulting services to address three topical areas:

1. *Revalidation of PSA’s risk assessment instrument.* Under this topic, PSA is interested in assessing whether and to what extent the predictive efficacy of its RAI may have degraded since the instrument was last calibrated in 2012. To the extent that it has, PSA would like to re-develop weights and schemas that can attain industry-wide predictive accuracy standards. Besides revalidation of the existing tool, PSA is keen on addressing three additional sub-topics:
 - a. Dynamic risk assessment. PSA is interested in testing whether there might be any benefits to re-assessing defendants on an on-going basis or multiple

times. The current risk assessment strategy is static—in that after a defendant is assessed initially, and a recommendation is made to the judge, PSA does not re-assess the individual irrespective of their success or failure in satisfying their conditions of release. PSA would like to see whether that are instances in which defendants should be re-assessed and, if so, how frequently.

- b. Information about synthetic drugs. PSA is keen to assess if the information gained from their universal screening for synthetic drugs has any implications for risk management.
- c. Specialized sub-population (defendants charged with non-fatal firearms offenses). PSA would like to assess whether and to what extent defendants charged with non-fatal firearm offenses pose special risk of pretrial misconduct and, if so, how this risk may be managed.

2. *Evaluate PSA's multi-dimensional release condition recommendations matrix.*

Under this topic, PSA is interested in assessing whether and to what extent the recommendation matrix is currently utilizes is consistent with its risk assessment instrument and whether it needs to be revised to align better with the tool.

3. *Assess the extent of bias in the instrument.* PSA is interested in assessing whether their RAI may contain unintentional bias. While an actuarial instrument is, by definition, meant to be free of human discretion and associated biases, recent research has shown that an instrument may still make biased recommendations if the data it was estimated from contains historic biases. PSA is interested in

researching this topic and ensuring that its RAI is free of such bias and that it makes socially responsible recommendations.

BACKGROUND

In 2009, the Urban Institute, in partnership with Maxarth, was commissioned by the Pretrial Service Agency for the District of Columbia (PSA) to develop and validate a risk assessment instrument for pretrial defendants. Assessing the defendant's likelihood of appearing in court and his or her danger to the community was of primary interest.

Specifically, areas of focal interest included enhancing the predictive validity of a risk assessment instrument (RAI), developing a specialized RAI for subpopulations of interest to the District, such as defendants charged with domestic violence or defendants testing positive for Phencyclidine (PCP); and validating the RAI while addressing the effect of pretrial supervision and treatment on the risk of pretrial misconduct.

Using administrative records of defendant cases that appeared in dockets filed in the U.S. District Court for the District of Columbia between October 2007 and August 2010, the research team developed risk models based on five domains for risk factors: defendant characteristics (9 factors), prior criminal history (39 factors), instant offense types (14 factors), lockup drug tests (5 factors), and current criminal justice status (3 factors). These risk factors were used to predict five pretrial misconduct outcomes, including (1) failure to appear, (2) any re-arrest, (3) re-arrest for a dangerous/violent/domestic violence crime charge, (4) re-arrest for a domestic violence charge, and (5) persistent drug use, for the general pretrial defendant population as well as six subgroups. The combination of multiple outcomes and subgroups resulted in 11

risk prediction models and resulting scales, all of which predicted the probability of pretrial misconduct fairly accurately.

After developing, validating, and evaluating the risk prediction models, researchers made several recommendations for PSA (Kim, Bhati, and Denver 2012).

These recommendations included:

- The new risk instruments were considerably more effective than the existing risk instrument in predicting the risk of pretrial misconduct.
- The risk of pretrial misconduct among female defendants was better predicted by a specialized RAI for female defendants than the general instrument for all defendants. It was recommended that a female-specific instrument be adopted for use.
- The potential benefit of implementing a specialized instrument for defendants testing positive for PCP did not outweigh the added complexity. Further, its performance in risk prediction was inferior to that of the general instrument. It was recommended that no further consideration be devoted to the special treatment of defendants testing positive for PCP in risk assessment.
- Measuring the risk of re-arrest for certain offenses, especially those involving violence or dangerous crime, better addresses public safety concern. There was a marginal gain in risk prediction by focusing on re-arrest for such offenses, as opposed any re-arrest. It was recommended that PSA consider a combined use of both instruments predicting the risk of any re-arrest and the risk of re-arrest for more dangerous offenses.

- The risk of re-arrest was found to fade out substantially within the first 30 days of pretrial release, after which point the risk of re-arrest remained fairly stable for several months. Hence, there was little or no need to conduct on-going risk assessment or dynamic assessment. It was recommended, however, that following pretrial release, a 30-day follow-up review for risk adjustment, conditional on compliance with supervision conditions, be considered for implementation.

PSA management adopted several of these recommendations and a revised, validated pretrial RAI was deployed in 2012.

While staff and management were generally satisfied with the performance of the validated instrument over the next few years there were some lingering concerns. In 2014, PSA contracted with Maxarth LLC to study some of these issues and provide recommendations where there was scope for improvement. PSA's Office of Strategic Development (OSD) prioritized the following three topics for closer examination:

1. Scoring of individual items in the risk assessment scheme.
2. Cut-points for each of the risk assessment instruments.
3. Combining the recommendations from multi-dimensional risk assessments.

Unlike traditional instruments, PSA's RAI assess the risk of a client along multiple dimensions. There are 4 separate risk assessments computed for each defendant—(i) failure to appear (FTA), (ii) re-arrest for any offense, (iii) re-arrest for dangerous, violent, or domestic violence offense, and (iv) among those charged with a domestic violence charge, re-arrest for another domestic violence offense. A multi-dimensional RAI like this provides keener insights into the *type* of risk a client poses. However, it can be harder to utilize a multi-dimensional RAI because it may provide

ambiguous classifications—a defendant might be high risk on one dimension but low on another. While it is mechanically possible to collapse the multiple dimensions into a single assessment, knowing the underlying multi-dimensional risk profile is extremely useful for making supervision recommendations. PSA has adopted a hybrid approach—the RAI produces risk classifications along four dimensions that are collapsed into a single final classification. This final classification—along with information in a defendant’s case file—is then used to make pretrial release and program recommendations.

Maxarth LLC provided consulting services to PSA and examined the three topics of interest to PSA management (Bhati 2015). Based on that analysis, it was recommended to PSA that:

1. The scoring scheme be left as is because the weights were mostly consistent with theoretical expectations and the few that were did not affect predictive efficacy at all and should be revisited at the time of a full revalidation study;
2. The cut-points for classification were largely satisfactory and, while some improvements could be made by revising them, such revisions should be undertaken at the time of a full revalidation study; and
3. PSA should consider adopting a three-step approach to better utilize the multi-dimensional assessment at its disposal.

With this background, PSA is now in a position to revalidate and enhance its RAI. In addition to the revalidation work, PSA has chosen to enhance its RAI by focusing additional effort on an assessment of (i) defendants charged with non-fatal firearm offenses, (ii) defendant who use synthetic cannabinoids, (iii) the question of dynamic risk

management strategies, (iv) PSA's multi-dimensional release conditions recommendation matrix, and (v) predictive bias in the instrument. While PSA's current RAI is state of the art, the enhancements requested by PSA will truly make its RAI unique among pretrial RAIs nationwide.

The issue of predictive bias has recently received much attention in the media. On a variety of fronts—pedestrian-police contacts (Ridgeway 2007), traffic stops (Lundman and Kaufman 2003), and risk assessment (Angwin et al 2016; Skeem and Lowenkamp 2016; Dieterich, Mendoza, and Brennan 2016)—the legitimacy of the criminal justice system has faced recent challenges that it reproduces patterns of adverse discrimination against disadvantaged groups (e.g., racial minorities), especially black and Hispanic/Latino persons. But there is little agreement as to the definition of what a fair system should look like. There are three criteria that have been developed in the academic literature (Kleinberg, Mullainathan, and Raghavan 2016):

1. *Statistical parity*: Under this criterion, a fair assessment predicts the same proportion of failures (e.g., recidivists or FTAs) for both the group with and without the sensitive attribute. If this between-group parity is not observed in the data, ignoring the predictions of the instrument entirely, then developing an instrument that conforms to this standard necessarily requires some trade-off of accuracy. In the criminal justice context, misclassification comes with the negative externality of diminished public safety.
2. *Balanced predictive value*: Conditional on the assessment's predicted value, the proportion of observed failures among those with and without the sensitive attribute should be equal. In other words, the proportion of cases within each

group who are classified as high risk that actually have a FTA or re-arrest should be the same.

3. *Balanced errors*: Conditional on the observed outcome, the assessment's misclassification rate should be equal for the both groups. Since classification errors are undeserved burdens, in the form of reduced liberty or increased exposure to sanction, the assessment should allocate this error equitably among the groups. In other words, the false positive rates for those classified as high-risk should be the same in different groups (e.g., racial or socio-economic groups).

While each of these three criteria makes sense in different contexts, the relative merits of one over the other are a matter of *choice* and not necessarily *science*. As such, the decision-makers utilizing the actuarial instruments must prioritize what criterion is of more importance to them. Once decided, different methods can be utilized to gauge the presence (and extent) of bias in the instrument. If found, there are a number of analytical techniques that can be used to mitigate the bias.

METHODOLOGY

This section provides details on the proposed methods that will be utilized for this effort. While the methods are described in fair amount of details, these are necessarily tentative. Upon meeting with PSA executives to clarify the scope of the work, some of the methods may be revised.

Data

The project will rely heavily on data present in PRISM (Pretrial Real-time Information System Manager)—the fairly detailed administrative data system used by PSA. PRISM contains rich data on (i) the current risk assessment measures, (ii) client

demographic information, (iii) criminal history, (iv) drug use, (v) conditions of supervision, (vi) compliance information, (vii) scheduled hearing data, (viii) appearance of failure to appear data, (xi) re-arrests, and (x) disposition data.

Given the goals of this project, as well as our familiarity with the PRISM system, we believe that data contained in PRISM will be sufficient. However, we will work with PSA IT staff should other data be available that might provide insights into any of the topic areas under study.

In consultation with PSA staff, we will define a recent cohort of defendants for whom complete PRISM data is available. These data will be extracted from the system and used for the analysis. Different cohorts might be needed for the different topical areas and we will work with PSA to make the best use of all available data.

Analytical Methods

There are three main types of analytical methods we envision utilizing for this research project. These relate to PSA's topic areas of interest. Each is described briefly below.

- *Revalidation.* For the revalidation effort, we will rely on standard methods to assess the adequacy of PSA's RAI as well as to enhance it.
 - This will include an assessment of changes in the underlying populations and outcomes since the last validation effort. For example, Kim, Bhati, and Denver (2012) contains detailed tables on the distribution of underlying data elements (attributes and outcomes) at the time of that study. Replication of the same attributes and outcomes with the more recent cohort will suggest if there

have been changes in the underlying population, the outcomes of interest, and/or the relationships between the predictors and the outcomes.

- Irrespective of changes in the underlying population, we will conduct a ROC (Receiver Operating Characteristic) analysis and compute AUC (Area Under the Curve) scores to assess if the several risk scores computed (and risk categories created) are still predictive of the outcomes. This is a true out-of-sample test as the risk scores were computed from weights estimated in 2012. We will assess if these weights continue to predict the outcomes in more recent years.
- We will utilize the same procedure used in the initial validation effort to develop weights and scores with the newer data to re-construct weights and assess if these revised weights produce more accurate predictions. If they do, we will also conduct a comparative analysis to assess the extent of recommendation changes that might ensue if revised sets of weights are introduced. While improved accuracy is always preferred in a revalidation effort, researchers need to guard against excessive reclassification of defendants. Excessive reclassification would typically be observed only if the underlying population has shifted considerably between the original validation and revalidation efforts. We will tabulate and study patterns of any systematic reclassifications before recommending a revised set of weights.
- Specialized analysis will be conducted to either include information on synthetic drugs and defendants charged with non-lethal firearm offenses into models or to study them as specialized sub-groups.

- *PSAs release conditions recommendation matrix.* PSA routinely recommends a combination of conditions of release for defendants who are not detained (or for whom they make no recommendations) and those that are not released on their own recognizance. These conditions might include, for example, combinations of curfew (HISP or non-HISP), substance abuse testing, substance abuse treatment, reporting requirements, or stay away orders. It is unclear how these recommendations align with the misconduct risk the defendants pose. Because defendants recommended for different conditions can and will have different attributes, a simple comparison of their misconduct rates might not provide the needed insights—that might result in comparing apples and oranges. As such a quasi-experimental design will be employed for this analysis. Models will be developed that relate risk of misconduct with defendant attributes and conditions of release so as to isolate any links. Once these models are developed, simulations will be conducted to assess the best set of recommendations that might help best manage risk. The simulations will be *resource constrained* so that they provide PSA leadership guidance of the best decision given existing resource constraints. Several simulated variants of the matrix will be developed and compared in terms of their ability to effectively manage risk. Empirical data and leadership feedback will be used to recommend the best solutions.
- *Predictive Bias.* As noted in the previous section, solutions to predictive bias are feasible once decision-makers make some choices in terms of their priorities. We propose the following approach for this topic area.

- Each of the types of bias will first be tested and estimated using the data and their consequences will be demonstrated to PSA leadership. Using empirical data, estimates of the various solutions will also be developed and shared with PSA leadership.
- Once leadership has a clear understanding of the choices they face and their consequences, bias-reducing algorithms will be used to redevelop weights/scores such that the best possible balance between bias reduction and predictive accuracy is achieved. Typically these methods use re-weighting techniques so as to re-calibrate the data in ways to remove association between the protected factors (like race) and the outcomes of interest (like misconduct) before estimating the scores.
- As a result of this analysis, we will develop for PSA leadership a Social Responsibility Report that is increasingly being recommended by those advocating for fairness and accountability in machine learning (see, for example, www.fatml.org). To preempt public scrutiny, PSA can disseminate this report along with the revalidation report. In the spirit of fairness and accountability, the report presents data on a comparison of average outcomes and prediction errors by different racial or socio-economic groups and lays out the corrective measures that have been taken to ensure PSAs instruments are unbiased.

WORK DEVELOPMENT PLAN

This section presents a proposed task plan for meeting the goals and objectives of the project. Work will be divided into three main categories—planning, analysis, and

dissemination. While the tasks are distinct, we expect a fair amount of overlap as the different phases and tasks feed into one another. This is reflected in the proposed task list and estimated timelines presented in Table 1. We have proposed an aggressive timeline and propose to complete the project within 12 months of contract award. A brief description of the tasks is provided following Table 1.

Table 1: Proposed Task List and Estimated Timeline.

Task #	Task Description	Estimated Timeline											
		Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18
I	PLANNING PHASE												
	I.A Kick off Meeting												
	I.B Review of Existing Instrument/Recommendation Matrix												
	I.C Present Overall Analysis Plan to PSA												
	I.D Acquire Relevant Data												
II	ANALYSIS PHASE (RAI Revalidation)												
	II.A Develop/Share Detailed Analysis Plan with PSA COR												
	II.B Share Initial Findings with PSA												
	II.C Based on Feedback Conduct Final Analysis												
	II.D Present Revalidation Findings to PSA												
III	ANALYSIS PHASE (Release Recommendations Matrix)												
	III.A Develop/Share Detailed Analysis Plan with PSA COR												
	III.B Share Initial Findings with PSA												
	III.C Based on Feedback Conduct Final Analysis												
	III.D Present Release Recommendations Findings to PSA												
IV	ANALYSIS PHASE (RAI Instrument Bias)												
	IV.A Develop/Present Initial Findings re Instrument Bias												
	IV.B Share Different Fairness Solutions/Consequences with PSA												
	IV.C Based on Feedback Conduct Final Analysis												
	IV.D Develop Social Responsibility Report												
V	DISSEMINATION												
	V.A Develop Comprehensive Final Report												
	V.B Review Findings with PSA Leadership												
	V.C Provide Implementation Support to PSA												

TASK I. PLANING PHASE – Estimated Sep 2017 – Oct 2017

TASK I.A. Kick off Meeting: The first task on the project will include much of the planning. We will hold a kick-off meeting with PSA staff and leadership to clarify scope of the work and different analysis requested by PSA.

TASK I.B. Review of Materials: Based on a complete understanding of PSA needs, a review of all relevant materials will be conducted next. This includes the existing risk assessment instrument and its current deployment as well as the release conditions recommendation matrix and its current usage.

TASK I.C. Overall Analysis Plan: An overall analysis strategy and timelines will be developed and shared with PSA. This will help Maxarth LLC plan for the distribution of effort over time and will help PSA plan for deliverables, implementation, and schedule meetings.

TASK I.D. Acquire Relevant Data: The final task in the planning phase will include data acquisition. Since much of the data will be acquired from PRISM and linking with external sources will not be needed, we will request de-identified data to protect the confidentiality of defendants. However, identifiers needed to track defendants dynamically while they are under PSA supervision will be requested. We will work with PSA IT and research staff to establish the best format for this data to be transferred. For example, depending on the analysis in questions we might obtain data extracted and converted into a single file or we might obtain data in relational tables that can be linked up at analysis time. All data requests will be made keeping the burden on PSA IT staff in mind. To ensure data security, we will follow an established data security plan. See Appendix for details.

TASK II. ANALYSIS PHASE (Revalidation work)—Estimated Oct 2017-Jan 2018

TASK II.A. Develop Detailed Analysis Plan. The first step will be to develop and share with PSA COR a detailed revalidation analysis plan that takes into consideration any

nuances unearthed during meetings with PSA leadership and staff as well as any specialized data limitations.

TASK II.B. Share Initial Findings: The next step in the revalidation effort will be to develop tables of distributions of the attributes and outcomes and do a comparative analysis with data from the last validation effort. This task will involve conducting ROC analysis and computing AUC statistics to gauge the predictive efficacy of the existing instrument without any changes. This task will also include the analysis to assess the desirability of including information about synthetic drugs and defendants charged with non-lethal firearm charges. These findings will be shared with PSA.

TASK II.C. Conduct Final Analysis: Based on feedback from PSA, the next step will be to conduct revised analysis and develop revised set of weights (if needed) to improve the predictive efficacy of the RAI. Based on initial findings, this step will entail including information about synthetic drugs and defendants charged with firearm offenses as additional predictors of risk or the computation of separate scores for these sub-populations.

TASK II.D. Present Findings: Findings of the revalidation effort will be presented to PSA stakeholders.

TASK III. ANALYSIS PHASE (Release Recommendations Matrix)—Estimated Dec 2017-Mar 2018

TASK III.A. Develop Detailed Analysis Plan. Based on a review of the materials, availability of data, and PSA leadership feedback, a revised/final analysis plan will be shared with PSA COR.

TASK III.B. Share Initial Findings with PSA COR: Next, the analysis described in the methodology section will be conducted and initial findings will be shared with PSA. This includes a comparison of some defendant profiles under different release conditions and a comparison of the misconduct rates. Where these comparisons are not feasible directly, regression analysis will be conducted to control for relevant attributes.

TASK III.C. Conduct Final Analysis: Based on the feedback from PSA, final analysis will be conducted. This will include comparisons of several variants of the existing recommendations matrix under resource constraints so that the total number of defendants recommended for various conditions remains constant. Similarly, based on feedback from PSA, we will develop simulations of scenarios where the resource constraints might be relaxed should PSA be interested in reducing/enhancing its reliance on one or the other recommendations types/categories.

TASK III.D. Present Findings: Findings of the evaluation of the adequacy of PSAs release recommendation matrix will be presented to PSA stakeholders.

TASK IV. ANALYSIS PHASE (Predictive Bias) – Estimated Feb 2018-Jun 2018

TASK IV.A. Develop/Share Initial Findings re Bias: As a first step under this task, we will develop a series of tables and run tests to ascertain the extent of bias (along race, gender or socio-economic criteria). These tables will demonstrate the extent of the bias, if it exists, and the dimensions (scores) along which it might exist. These findings will be shared with PSA.

TASK IV.B. Share Different Possible Solutions: As noted in the methodology section, depending on the type of bias PSA's instrument might contain and the type of bias PSA

finds most egregious, different corrective measures are possible. Under this task, we will present different solutions to PSA and demonstrate the consequences of these corrective measures. This will allow PSA to make an informed decision about how best they want to deal with bias, if it exists, in their instruments.

TASK IV.C. Conduct Final Analysis: Based on the initial analysis and PSA's priorities we will conduct final analysis. This task will result in a revised set of weights/scores that account for any corrective measures taken to eliminate bias from the instrument.

TASK IV.D. Develop Social Responsibility Report: A report documenting the efforts to uncover and eliminate bias (along race, gender or socio-economic status) from PSAs instruments will be developed and comparative analysis tabulated in this Social Responsibility Report.

TASK V. DISSEMINATION—Estimated Jun 2018-Sep 2018

TASK V.A. Comprehensive Final Report(s): The findings, recommendations, and presentations developed under each of the previous tasks will be combined into one comprehensive research report and be presented to PSA leadership for review.

TASK V.B. Review Findings with Leadership: Once PSA leadership has reviewed this comprehensive report a final presentation will be scheduled. At this presentation, PSA leadership and stakeholders will have the opportunity to clarify any of the analysis conducted as well as their policy or practical implications. Much of this material will have been shared with them prior to this presentation. However, this final presentation will allow them an opportunity to make final comments as well as decide on follow-on work as necessary.

TASK V.C. Implementation Support: We will take the comments made by PSA leadership and stakeholders and revise the final report. In addition, under this task, Maxarth staff will work with PSA operations and IT staff to implement any of the recommendations. Maxarth staff will also work with PSA research staff should they be interested in converting any of the findings and reports into publications for wider dissemination outside of PSA.

GENERAL TASKS—Ongoing

Regular meeting will be schedule to keep the PSA COR updated on analysis progress and challenges. A quarterly progress report will be submitted to the PSA COR.

APPENDIX A: SELECTED REFERENCES

- Angwin, J., Larson, J., Mattu, S., and Kirchner, L. (2016). Machine bias. Available: <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>.
- Bhati, A.S. (2014). *A Review of PSA's Risk Assessment Instrument: Final Report*. Gaithersburg, MD: Maxarth LLC.
- Kim, K, Bhati, A.S., and Denver, M (2012). *Development and Validation of Risk Assessment Instruments for Pretrial Defendants in the District of Columbia*. Washington, DC: The Urban Institute.
- Lundman, R.J. and Kaufman, R.L. (2003) "Driving while black: Effects of race, ethnicity, and gender on citizen self-reports of traffic stops and police actions," *Criminology*, 41 [195–220]
- Ridgeway, G. (2007). *Analysis of Racial Disparities in the New York Police Department's Stop, Question, and Frisk Practices*. Santa Monica, CA: Rand Corporation.
- Skeem, J.L. and Lowenkamp, C.T. (2016). "Risk, race, & recidivism: Predictive bias and disparate impact," *SSRN Electronic Journal*, June 2016.
- Dieterich, W., Mendoza, C., and Brennan, T. (2016) "COMPAS risk scales: Demonstrating accuracy equity and predictive parity" Tech. Rep., Northpointe. Jul. 2016.
- Kleinberg, J., Mullainathan, S., and Raghavan, M. (2016) "Inherent Trade-Offs in the Fair Determination of Risk Scores," *ArXiv e-prints*, Available: <https://arxiv.org/abs/1610.07524v1>.

APPENDIX B: ENSURING DATA INTEGRITY AND SECURITY

To the extent possible, we will utilize data that is not identifiable to an individual. This will mean any data we acquire from PSA will be de-identified (all names and other readily identifiable information will be removed). Despite that, we will ensure that all data are analyzed on a password-protected computer and any data stored on external media (e.g., CDs or DVDs) will be stored in a locked secure location. Upon the completion of the project, we will either return all such external media to PSA or destroy them. All data acquired from PSA for the project will also be deleted from all computers and either returned to PSA or destroyed permanently. All personnel (contractor staff or consultants) will be required to sign a data confidentiality pledge prior to gaining access to data.

APPENDIX C: PROJECT MILESTONES AND DUE DATES

Table 2: Project tasks, milestones, and estimated due dates.

Task #	Task Description	Due Date
I	PLANNING PHASE	
I.A	Kick off Meeting	9/7/17
I.B	Review of Existing Instrument/Recommendation Matrix	9/14/17
I.C	Present Overall Analysis Plan to PSA	9/30/17
I.D	Acquire Relevant Data	10/10/17
II	ANALYSIS PHASE (RAI Revalidation)	
II.A	Develop/Share Detailed Analysis Plan with PSA COR	10/10/17
II.B	Share Initial Findings with PSA	11/15/17
II.C	Based on Feedback Conduct Final Analysis	1/15/18
II.D	Present Revalidation Findings to PSA	1/24/18
III	ANALYSIS PHASE (Release Recommendations Matrix)	
III.A	Develop/Share Detailed Analysis Plan with PSA COR	12/1/17
III.B	Share Initial Findings with PSA	2/15/18
III.C	Based on Feedback Conduct Final Analysis	3/15/18
III.D	Present Release Recommendations Findings to PSA	3/24/18
IV	ANALYSIS PHASE (RAI Instrument Bias)	
IV.A	Develop/Present Initial Findings re Instrument Bias	3/31/18
IV.B	Share Different Fairness Solutions/Consequences with PSA	4/30/18
IV.C	Based on Feedback Conduct Final Analysis	6/15/18
IV.D	Develop Social Responsibility Report	6/24/18
V	DISSEMINATION	
V.A	Develop Comprehensive Final Report	7/24/18
V.B	Review Findings with PSA Leadership	8/10/18
V.C	Provide Implementation Support to PSA	9/1/18

APPENDIX D: QUALITY ASSURANCE SURVEILLANCE PLAN (QASP)

Table 3: Quality Assurance Surveillance Plan (QASP)

Deliverable	Performance Standard	AQL	Monitoring Method	Performance Incentive or Reduction
Quarterly status reports by 5:00 pm on the last business day of every third month; Meet with COR and relevant staff by telephone quarterly to check the status and progress of the project.	Brief progress report; quarterly meetings held.	95-100% of meetings are held consistently every third month.	COR feedback.	Revised schedule or positive/negative performance evaluation.
Research design, including evaluation model and data collection strategy.	Written report.	100% comprehensive report addressing all areas is submitted.	COR review and feedback.	Revised schedule or positive/negative performance evaluation.
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation and power point slides.	100% in person verbal presentation and power point slides.	COR and PSA leadership feedback.	Revised schedule or positive/negative performance evaluation.
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation.	100% in person verbal presentation and meeting.	COR and select PSA staff feedback.	Revised schedule or positive/negative performance evaluation.
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation.	100% in person verbal presentation and meeting.	COR feedback.	Revised schedule or positive/negative performance evaluation.
Final report within 12 months of contract award. Report will describe analysis, present tables of results, finalized recommended risk assessment instrument, recommendation matrix, and predictive bias findings.	Written report.	100% comprehensive report.	COR review and feedback.	Revised schedule or positive/negative performance evaluation.

APPENDIX E: COST PROPOSAL

Table 4: Cost Proposal.

Direct Labor <i>Labor Category</i> Principal Investigator (Dr. Bhati)
Other Direct Costs (ODC) <i>Cost Description</i> Senior Consultant (TBD) Materials Equipment
Overhead and G&A <i>Base description</i> 15% of Direct labor+ODC
Profit & Fee <i>Base description</i> 8% of Direct labor+ODC+Overheads
Project Total



APPENDIX F: PROPOSED PAYMENT SCHEDULE

Table 5: Proposed Payment Schedule

Payment #	Invoice Date	Amount	Tasks completed
1	30-Sep-17		Kick-off meeting and analysis plan submitted.
2	31-Oct-17		Data acquired, processed, and tested for adequacy.
3	30-Nov-17		RAI revalidation initial findings shared with PSA.
4	31-Dec-17		Recommendation matrix reviewed and analysis plan submitted.
5	31-Jan-18		RAI revalidation in-person presentation.
6	28-Feb-18		Recommendation matrix initial findings shared with PSA.
7	31-Mar-18		Recommendation matrix analysis in-person presentation.
8	30-Apr-18		Predictive bias initial findings shared with PSA.
9	31-May-18		Predictive bias alternate strategies shared with PSA.
10	30-Jun-18		Predictive bias analysis in-person presentation.
11	31-Jul-18		Comprehensive final report submitted.
12	31-Aug-18		Comprehensive final in-person presentation to stakeholders.
13	30-Sep-18		Implementation consultation completed.
Total			

APPENDIX G: KEY PERSONNEL

Avinash Bhati, PhD

Principal Investigator

President, Maxarth LLC

[REDACTED]

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abhati@maxarth.com

(301) 873-1898

AVINASH BHATI, PhD

PRESIDENT, MAXARTH LLC

EDUCATION

- Ph.D. Economics (May 2001), College of Arts and Sciences, American University, Washington, DC.
Dissertation Title: "Environmental heterogeneity in models predicting criminal recidivism: Isolating the contribution of individual-level characteristics."
Advisory Committee: Amos Golan (Chair), James P. Lynch, and Robert M. Feinberg.
- M.B.A. Finance (1993), College of Business and Public Management (COBPM), University of the District of Columbia, Washington, DC.
- B.A. History/Political Science (1990), Rajasthan College, Jaipur, India.
- Other — *Bayesian Econometrics and Decision Making* (2006), Summer Program in Applied Econometrics, American University, Washington, DC (Instructor: John Geweke).
— *Missing Data* (2003), Washington, DC (Instructor: Paul Allison).
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PROFESSIONAL EXPERIENCE

- OCT 2008 – PRESENT President,
Maxarth LLC
Maxarth provides creative data and analytic solutions for challenging real-world problems or opportunities. Through research consulting services and direct technical assistance, we provide the empirical analysis needed to make difficult operational and strategic decisions with confidence. Maxarth staff work in close collaboration with a multi-disciplinary network of partners from around the nation. We engage with subject matter experts and technology companies to combine our skills, knowledge, and experience to provide the most timely and relevant analysis. Our clients have included the Court Services and Offender Supervision Agency (CSOSA) and the Pretrial Services Agency (PSA) for the District of Columbia, Center for Education and the Workforce (Georgetown University, DC), Research and Evaluation Center (John Jay College of Criminal Justice, NY), Center for Advancing Correctional Excellence (George Mason University, VA), Justice Policy Center (The Urban Institute, DC), Pretrial Justice Institute, PEW Charitable Trusts, National Center for State Courts, Florida State University, and numerous individuals.
- MAY 1999 – SEP 2009 Research Associate, Senior Research Associate (Jan 2007 – Sep 2009)
Justice Policy Center, The Urban Institute, Washington, DC
As Research Associate at the Justice Policy Center, I supervised and undertook all aspects of quantitative research. Projects I have led or contributed to included such topics as the evaluation of programs aimed at reducing crime; analysis of sentencing outcomes; spatial analysis of crime; understanding supervision failure, modeling individual offending patterns; and the development of innovative analytical methods for analyzing crime and justice related issues.

APPOINTMENTS

JUL 2015 – PRESENT	<i>"Research Affiliate"</i> Maryland Data Analysis Center (MDAC), Department of Criminology and Criminal Justice, University of Maryland, College Park, MD.
OCT 2013 – MAR 2015	<i>"BJS Visiting Fellow: Criminal Justice Statistics Program"</i> Bureau of Justice Statistics, Office of Justice Programs, Washington, DC.
OCT 2010 – MAR 2013	<i>"BJS Visiting Fellow: Corrections"</i> Bureau of Justice Statistics, Office of Justice Programs, Washington, DC.
MAY 2010 – FEB 2012	<i>"Data Analysis Expert – Jerry M., et al., v. District of Columbia, et al."</i> Office of the Special Arbiter, Washington, DC

RESEARCH PROJECT EXPERIENCE

AUG 2015 – MAR 2017	<i>"Simulating Public Safety Implications of Altering Length of Stay in Prison"</i> Justice Policy Center, Urban Institute, Washington, DC Maxarth LLC developed a set of models for simulating the public safety implications of reducing prisoner length of stay.
OCT 2015 – OCT 2016	<i>"Auto Screener: Validating Offender Risk and Needs Assessments"</i> Court Services and Offender Supervision Agency for the District of Columbia Maxarth LLC developed supervised and unsupervised learning algorithms to produce state of the art offender risk and needs assessments for the agency.
JAN 2014 – PRESENT	<i>"Measuring Success in Focused Deterrence"</i> Temple University, Philadelphia, PA Maxarth LLC partnered with Temple University in its efforts to measure the impacts of focused deterrence initiatives undertaken by the Philadelphia Police Department.
JUL 2010 – PRESENT	<i>"Risk-Needs-Responsivity Simulation Tool"</i> Center for Advancing Correctional Excellence (ACE!), George Mason University, Fairfax, VA Maxarth LLC is partnering with ACE! to develop, validate, and deploy an online simulation tool designed to help justice practitioners make evidence-based offender programming choices.
OCT 2010 – SEP 2012	<i>"Monitoring and Assessing the Effectiveness of Juvenile Justice Sanctions"</i> (with co-PI Dr. Dan Mears) Office of Juvenile Justice and Delinquency Prevention, Office of Justice Programs, Washington, DC Maxarth LLC partnered with the Florida State University in a study describing de-facto juvenile justice sanctioning policies in the state of Florida and to study their effectiveness.
OCT 2010 – MAY 2011	<i>"Evaluating DCPSA's In-House Substance Abuse Treatment Program"</i> Pretrial Services Agency, Court Services and Offender Supervision Agency for the District of Columbia Maxarth LLC partnered with the Urban Institute in conducting a process and outcome evaluation of the agencies in-house substance abuse treatment program (STARS).
MAY 2010 – JUN 2011	<i>"Simulating the Implications of Reducing Length of Stay"</i> Public Safety Performance Project, PEW Charitable Trusts, Washington, DC Maxarth LLC lead an effort to study the public-safety implications of reducing length of stay in prison using data from three states.
OCT 2009 – SEP 2011	<i>"Pretrial Risk Assessment and Validation,"</i> (with co-PI Kideuk Kim of the Urban Institute) Pretrial Services Agency, Court Services and Offender Supervision for the District of Columbia. Maxarth LLC partnered with the Urban Institute to develop and validate a state-of-the-art risk assessment instrument for the District of Columbia's Pretrial Services Agency designed to accurately assess risk of pretrial misconduct (including rearrest and failure to appear in court).

- OCT 2007 – SEP 2009 *"Learning from Multiple Analogies: An Information-Theoretic Framework for Studying Criminal Recidivism," American Statistical Association and the U.S. Bureau of Justice Statistics.*
This study developed a new approach for incorporating knowledge from multiple outcomes into a model for studying event histories (in particular, criminal recidivism).
- OCT 2007 – DEC 2009 *"Quantifying the Specific Deterrent Effects of DNA Databases," U.S. National Institute of Justice.*
This project, funded through the Urban Institute, applied a new modeling techniques to quantify whether and to what extent recording offenders' DNA evidence into a databases (for future searches) deters them from committing crimes.
- OCT 2008 – OCT 2009 *"Evaluating the Kiosk Reporting System for Low-Risk Offenders under Community Supervision," Court Services and Offender Supervision Agency (CSOSA) for the District of Columbia.*
This project utilized administrative data to identify a set of low-risk offenders particularly well suited for inclusion in a pilot study that will replace active supervision (e.g., reporting in person) with passive supervision strategies (e.g., reporting to a Kioks).
- OCT 2006 – SEP 2008 *"Modeling Supervision Failure," Court Services and Offender Supervision Agency (CSOSA) for the District of Columbia.*
A team of Urban Institute researchers developed innovative methods to estimate and validate a supervision risk assessment instrument measuring latent risk of criminal recidivism.
- SEP 2005 – DEC 2007 *"An Empirical Investigation of 'Going to Scale' in Drug Intervention," (with Co-PI: John Roman) U.S. National Institute of Justice.*
Study Co-PIs developed new ways to combine information in multiple nationally representative data sources to provide policy makers estimates of the number of drug dependent offenders that could be effectively served by partnerships between courts and drug treatment.
- JAN 2006 – DEC 2006 *"Estimating the Number of Crimes Averted by Incarceration," U.S. National Institute of Justice, Cost-Benefit Analysis Series, Study 1.*
An innovative method of analyzing criminal history records was developed to produce estimates of the number of crimes averted by incarcerating offenders. Findings were published in a recent special issue of the *Journal of Quantitative Criminology*.
- APR 2005 – JUL 2006 *"Life Interrupted: Studying the Effects of Incarceration on Criminal Trajectories," Data Resources Program, U.S. National Institute of Justice.*
A new data analysis approach was used to assess the effects of incarceration on future individual offending. Findings were published in a recent issue of the *Journal of Criminal Law and Criminology*.
- SEP 2004 – AUG 2006 *"Modeling Limited Discretionary Regimes: An Information-Theoretic Approach," U.S. National Science Foundation, Law and Social Science Program.*
This funding was used to develop new models of judicial discretion that allows researchers to investigate various concerns, possibly competing, that judges may have to simultaneously take into account when sanctioning offenders. Findings are documented in a manuscript currently under review.
- JUN 2003 – OCT 2004 *"Does Post-Prison Supervision Matter?" (with Co-PI: Amy Solomon) The JEHT Foundation, New York.*
For this project secondary data was used to assess the effects of prisoner release mechanism on the risk of re-offending. (Final report: <http://www.urban.org/url.cfm?ID=311156>).
- MAY 2002 – OCT 2003 *"Robust Spatial Analysis of Rare Crimes: Modeling Disaggregated Homicide Rates." Mapping and Analysis for Public Safety program, U.S. National Institute of Justice.*
This project developed an innovative statistical procedure for investigating the determinants of rare crimes. Findings were published in a recent volume of *Sociological Methodology*.

PEER-REVIEWED PAPERS

- Mears, D. P., Cochran, J. C., Bales, W. D., and Bhati, A. S. (2016) "Recidivism and Time Served in Prison" *Journal of Criminal Law and Criminology*, 106(4): 83 - 124.
- Bhati, A. S., and Roman, C. G. (2014) "Evaluating and Quantifying the Specific Deterrent Effects of DNA Databases" *Evaluation Review*, 38(1): 68 - 93.
- Mears, D. P., Cochran, J. C., Stults, B. J., Greenman, S. J., Bhati, A. S., and Greenwald, M. A. (2014) "The 'True' Juvenile Offender: Age Effects and Juvenile Court Sanctioning." *Criminology*, 52(2): 169-194.s
- Bhati, A. S., Crites, E. L., and Taxman, F. S. (2013) "RNR Simulation Tool: A Synthetic Dataset and Its Uses for Policy Simulations" in *Simulation Strategies to Reduce Recidivism* ed. Taxman, F. S., and Pattavina, A. New York, NY: Springer.
- Mears, D. P., Cochran, J. C., Greenman, S. J., Bhati, A. S., and Greenwald, M. A. (2011) "Evidence on the Effectiveness of Juvenile Court Sanctions." *Journal of Criminal Justice*, 39(6): 509-520.
- Bhati, A. S., and Roman, J. (2010) "Simulated Evidence on the Prospects of Treating More Drug-Involved Offenders." *Journal of Experimental Criminology*, 6(1):1-33.
- Bhati, A. S. (2008) "A Generalized Cross-Entropy Approach for Modeling Spatially Correlated Counts." *Econometric Reviews*, 27(4-5):574-595.
- Bhati, A. S., and Piquero, A. R. (2007) "Estimating the Impacts of Incarceration on Subsequent Offending Trajectories: Deterrent, Criminogenic, or Null Effects?" *Journal of Criminal Law and Criminology*, 98(1):207-253.
- Bhati, A. S. (2007) "Estimating the Number of Crimes Averted by Incapacitation: An Information-Theoretic Approach." *Journal of Quantitative Criminology*, 23(4):355-375.
- Mears, D. P., Scott, M. L., and Bhati, A. S. (2007) "Opportunity Theory and Agricultural Crime Victimization." *Rural Sociology*, 72(2):151-184.
- Mears, D. P., Scott, M. L., and Bhati, A. S. (2007) "A Process and Outcome Evaluation of an Agricultural Crime Prevention Initiative." *Criminal Justice Policy Review*, 18(1):51-80.
- Mears, D., and Bhati, A. S. (2006) "No Community is an Island: The Effects of Resource Deprivation on Urban Violence in Spatially and Socially Proximate Communities." *Criminology*, 44(3):509-547.
- Bhati, A. S. (2005) "Robust Spatial Analysis of Rare Crimes: An Information-Theoretic Approach." pp. 239-301 in *Sociological Methodology*, Volume 35, edited by Ross M. Stolzenberg. Washington, DC: American Sociological Association.
- Golan, A., Bhati, A. S., and Buyuksahin, B. (2005) "An Information-Theoretic Approach for Image Reconstruction: The Black and White Case." pp. 223-230 in *Bayesian Inference and Maximum Entropy Methods in Science and Engineering*, edited by Knuth, Abbas, Morris, and Castle, Melville, NY: American Institute of Physics.
- Bhati, A. S. (2005) "Count Outcomes with Spatial Structures: An Information-Theoretic Approach." 2005 Proceedings of the American Statistical Association, Business and Economics Statistics Section [CD-ROM], Alexandria, VA: American Statistical Association.
- Bhati, A. S., Buyuksahin, B., and Golan, A. (2005) "An Information-Theoretic Approach for Estimation and Image Reconstruction." 2005 Proceedings of the American Statistical Association [CD-ROM], Alexandria, VA: American Statistical Association.

WORKING PAPERS

- Bhati, A. S. "Learning from Multiple Analogies: An Information-Theoretic Framework for Modeling Criminal Recidivism." MPRA Paper No. 11850, <http://mpra.ub.uni-muenchen.de/11850/>
- Bhati, A. S. "Motivational Structures Underlying Judicial Discretion: An Information Theoretic Investigation." MPRA Paper No. 57834, <http://mpra.ub.uni-muenchen.de/57834/>

REPORTS

- *Risk Assessment Tool for the Allegheny County Community Supervision Population*, Final report submitted to the Allegheny County Department of Human Services, Pittsburgh, PA: Oct 2015.
- *A Review of PSA's Risk Assessment Instrument*, Final report submitted to the Pretrial Services Agency for the District of Columbia: Oct 2015.
- *Multi-Component System Dynamics: Studying Dependencies Within and Across Stages of the Federal Criminal Justice System*, Final report submitted to the Bureau of Justice Statistics, Office of Justice Program, Department of Justice, Washington, DC: May 2015.
- *Allegheny County (PA) Pretrial Risk Assessment Instrument Development and Validation Study*, Pretrial Justice Institute, Washington, DC: Dec 2012.
- *Monitoring and Assessing the Effectiveness of Juvenile Justice Sanctions*, Final report submitted to the Office of Juvenile Justice and Delinquency Prevention, Washington, DC: Oct 2012 (Co-authored with Dan Mears, Josh Cochran, and Sarah Greenman).
- *Assessing the Need for Group-Specific Risk Assessment Instruments for AutoScreener*, Final report submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: Aug 2012 (Co-authored with Afi Harrington).
- *Development and Validation of Risk Assessment Instruments for Pretrial Defendants in the District of Columbia*, The Urban Institute, Washington, DC: March 2012 (Co-authored with Kideuk Kim and Megan Denver).
- *The Bronx Defenders Clients Compared with Traditionally Defended Bronx Clients*, Maxarth, LLC, Gaithersburg, MD: Feb 2012 (Co-authored with Nancy Jacobs).
- *Static and Dynamic Risk Suppression: A Regression-Discontinuity Analysis*, Final report submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: Jan 2012.
- *How Much Prison Time is Enough?*, Final report submitted to PEW Charitable Trusts, Washington, DC: Nov 2011 (Co-authored with James Austin and Gerald Gaes).
- *Time Served as a Treatment: Analyzing the Effects of Different Levels of Time Served on Recidivism by Partitioning Time Served and Balancing on the Propensity Score*, Final report submitted to the PEW Charitable Trusts, Washington, DC: Oct 2011 (Co-authored with Gerald Gaes and James Austin).
- *Analysis of Risk and Outcome Data for Youth Link Program, Police Action League (PAL)*, Maxarth, LLC, Gaithersburg, MD: May 2011 (Co-authored with Nancy Jacobs).
- *Exploring Promising Intervention Pathways for High-Risk Offenders*, Final report submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: June 2011 (Co-authored with Afi Harrington).
- *Development of A Validated Risk Assessment Instrument for Maricopa County Adult Probation Pretrial Services Division*, Pretrial Justice Institute, Washington, DC: March 2011 (Co-authored with John Clark).
- *Kentucky Pretrial Risk Assessment Instrument Validation*, The JFA Institute, Malibu, CA: Oct 2010 (Co-authored with James Austin and Roger Ocker).
- *Synthesizing Evidence: An Information-Theoretic Approach*, Final report submitted to the DC Crime Policy Institute, Urban Institute, Washington, DC: Aug 2010.
- *Quantifying the Specific Deterrent Effects of DNA Databases*, Final report submitted to the National Institute of Justice, Washington, DC: March 2010. (<http://www.urban.org/url.cfm?ID=412058>)
- *Simulated Evidence on the Effectiveness of Passive Supervision Strategies*, Final report submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: October 2009.
- *Validating AutoScreener Final Report (Volume II), Technical Report*, Submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: September 2009 (Co-authored with Mark Coggeshall, CSOSA).

- *Validating AutoScreener Final Report (Volume I), Community Supervision Officer Perceptions*, Submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: September 2009 (Co-authored with Michelle Burk-Storer and Mark Coggeshall).
- *To Treat or Not To Treat: Evidence on the Prospects of Expanding Treatment to Drug-Involved Offenders*, Final report submitted to the National Institute of Justice, Washington, DC: April 2008 (Co-authored with John Roman and Aaron Chalfin). (<http://www.urban.org/url.cfm?ID=411645>)
- *Alcohol Outlets as Attractors of Violence and Disorder: A Closer Look at the Neighborhood Environment*, Final report submitted to the National Institute of Justice, Washington, DC: April 2008 (Co-authored with Caterina Roman, Shannon Reid, and Bogdan Tereshchenko). (<http://www.urban.org/url.cfm?ID=411663>)
- *An Information Theoretic Method for Estimating the Number of Crimes Averted by Incapacitation*, Final report submitted to the National Institute of Justice, Washington, DC: June 2007. (<http://www.urban.org/url.cfm?ID=411478>)
- *A Process and Impact Evaluation of the Agricultural Crime, Technology, Information, and Operations Network (ACTION) Program*, Final report submitted to the National Institute of Justice, Washington, DC: August 2006 (Co-authored with Dan Mears and Michelle Scott). (<http://www.urban.org/url.cfm?ID=411455>)
- *Policy, Theory, and Research Lessons from an Evaluation of an Agricultural Crime Prevention Program*, Policy brief submitted to the National Institute of Justice, Washington, DC: August 2006 (Co-authored with Dan Mears and Michelle Scott). (<http://www.urban.org/url.cfm?ID=411456>)
- *Studying the Effects of Incarceration on Offending Trajectories: An Information-Theoretic Approach*, Technical report submitted to the Data Resources Program, National Institute of Justice (NIJ), Washington, DC: July 2006. (<http://www.urban.org/url.cfm?ID=411427>)
- *Does Parole Work? Analyzing the Impact of Postprison Supervision on Rearrest Outcomes*, The Urban Institute Press, Washington, DC: March 2005 (Co-authored with Amy Solomon and Vera Kachnowski). (<http://www.urban.org/url.cfm?ID=311156>).
- *Weed and Seed Indicator Project: Report on Enhanced Performance Measure Approaches*, Report submitted to the Executive Office of Weed and Seed (EOWS), Washington, DC: April 2004 (Co-authored with Laura Winterfield, Sinead Keegan, and Terry Dunworth).
- *Gang Reduction Program: Baseline Crime Analysis Reports for North Miami Beach (FL), Richmond (VA), Los Angeles (CA), and Milwaukee (WI)*, Reports submitted to the Office of Juvenile Justice and Delinquency Prevention (OJJDP), Washington, DC: March–April 2004 (Co-authored with Sinead Keegan, Deborah Chester, Karen Beckman, Kevin Roland, Michelle Scott, and Dave Hayeslip).
- *Robust Spatial Analysis of Rare Crimes*, Technical report submitted to the Mapping and Analysis for Public Safety Program, National Institute of Justice (NIJ), Washington, DC: March 2004. (<http://www.urban.org/url.cfm?ID=410988>).
- *An Impact Evaluation of the Maryland Break the Cycle Initiative*, Final report submitted to the Maryland Governors Office of Crime Control and Prevention (GOCCP), Annapolis, MD: June 2003 (Co-authored with Adele Harrell, John Roman and Barbara Parthasarthy). (<http://www.urban.org/url.cfm?ID=410807>).

JOURNAL REVIEWER SERVICES

- Journal of Quantitative Criminology (Editorial board member – 2008 to 2015)
- Criminology
- Social Forces
- Social Problems
- Criminology and Public Policy
- Academy of Criminal Justice Sciences
- Social Science Computing Review
- Addiction



CREATIVE DATA AND ANALYTICAL SOLUTIONS

CORPORATE CAPABILITIES STATEMENT

Maxarth provides criminal justice related data science services to governmental agencies, educational institutions, research centers, international organizations, professional associations, non-profit organizations, for-profit companies and private individuals. We deliver creative data and analytical solutions for challenging real-world problems or opportunities.

Mission: To provide criminal justice clients with the actionable knowledge and practical tools that better equip them to make choices with confidence.

Differentiators:

- Employ modern data science tools.
- Synthesize all available evidence.
- Devise creative solutions.
- Deliver practical data products.

Services: Maxarth staff collaborates with a multi-disciplinary network of partners from around the nation. We combine our skills, knowledge, and experience with subject matter experts to conduct relevant and reliable analysis. Our services include:

- *Data Synthesis and Management*—we synthesize information from a variety of data sources; create simulation and optimization tools; and design synthetic decision support systems.
- *Predictive Analysis*—we design and undertake risk or needs assessment & validation studies; model, trace, and predict risk trajectories; and generate short-, medium-, or long-term forecasts.
- *Evaluation and Prescriptive Analysis*—we evaluate programs, policies, and practices; undertake experimental or quasi-experimental studies; devise micro-simulation tools; and conduct counterfactual policy simulations.
- *Capacity Building*—we train clients on the appropriate use of empirical evidence; how to recover robust information from transactional data; practical ways to devise and utilize simulation tools; and to appreciate the powers and limitations of data science.

Past and Current Clients:

- *Government*—U.S. Department of Justice, Court Services and Offender Supervision Agency for the District of Columbia, and Pretrial Services Agency for the District of Columbia.
- *Educational Institutions*—Georgetown University; George Mason University; American University; University of Maryland; State University of New York; Florida State University; and Temple University.
- *Research Organizations*—Pew Charitable Trusts; Urban Institute; ICF International; RTI International; Center for Education and the Workforce; Center for Advancing Correctional Excellence; Pretrial Justice Institute; and National Center for State Courts.

Sample Past Performance:

- *CSOSA*: The Court Services and Offender Supervision Agency for the District of Columbia has contracted with Maxarth to validate and deploy Auto Screener—a state of the art risk and needs assessment software for managing probation and parole populations in the District of Columbia. Maxarth has undertaken numerous such efforts around the nation.
- *USDOJ*: Maxarth president served as a Visiting Fellow at the Bureau of Justice Statistics (U.S. Department of Justice). He brought together data from a diverse array of federal criminal justice agencies and developed data products designed to study dependencies within and across stages of the federal criminal justice system and predict population dynamics.
- *PEW*: The Pew Charitable Trusts contracted with Maxarth to evaluate a number of its Justice Reinvestment Initiatives implemented in several states. Maxarth also developed an innovative simulation model to help Pew quantify the public safety implications of diverting low-risk offenders away from prison toward community-based sanctions.
- *GMU*: Maxarth partners with the Center for Advancing Correctional Excellence (ACE) at George Mason University to develop an innovative data product that powers an online decision support tool for managing correctional populations.
- *UMD*: Maxarth is partnering with the Department of Criminology (University of Maryland) to help launch the Maryland Data Analysis Center (MDAC). Maxarth is assisting MDAC develop data products and tools that can provide researchers, practitioner, and policy-makers with easy access to actionable knowledge about the Maryland Criminal Justice System.

Corporate Data:

<i>Registered Name:</i>	Maxarth LLC
<i>DUNS Number:</i>	829885289
<i>Year Formed:</i>	2008
<i>State of Incorporation:</i>	Maryland
<i>Certification:</i>	SBA 8(a) Maryland MBE/DBE/SBE Virginia Swam/DBE

North American Industry Classification System (NAICS)

541511	Custom Computer Programming Services
541720	R&D in Social Sciences and Humanities
541611	Administrative Management & General Management Consulting Services
518210	Data Processing Hosting & Related Services

Contact Information:

Cell:	(301) 873-1898	Voice:	(301) 789-2966
Fax:	(301) 880-7152	Email:	abhati@maxarth.com

SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30				1. REQUISITION NUMBER PSA170218		PAGE 1 OF 34	
2. CONTRACT NO. PSA17C0043		3. AWARD/EFFECTIVE DATE 09/07/2017		4. ORDER NUMBER		5. SOLICITATION NUMBER PSA17Q0034	
6. SOLICITATION ISSUE DATE 08/07/2017		7. FOR SOLICITATION INFORMATION CALL:		a. NAME		b. TELEPHONE NUMBER (No collect calls)	
8. OFFER DUE DATE/ LOCAL TIME 08/16/2017		9. ISSUED BY PSA Pretrial Services Agency 633 Indiana Ave, NW, Suite 1134 Washington, DC, 20004, US		CODE 959P00		10. THIS ACQUISITION IS <input type="checkbox"/> UNRESTRICTED OR <input checked="" type="checkbox"/> SET ASIDE: 100 % FOR:	
				<input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> WOMEN-OWNED SMALL BUSINESS (WOSB) <input type="checkbox"/> HUBZONE SMALL BUSINESS <input type="checkbox"/> ECONOMICALLY DISADVANTAGED WOMEN-OWNED SMALL BUSINESS (EDWOSB) <input type="checkbox"/> SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS <input checked="" type="checkbox"/> 8 (A)		NAICS: 541720 SIZE STANDARD: \$20,500,000	
11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input type="checkbox"/> SEE SCHEDULE		12. DISCOUNT TERMS Net Days - 15		13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) <input type="checkbox"/>		13b. RATING	
15. DELIVER TO See Schedule		CODE		16. ADMINISTERED BY PSA Pretrial Services Agency 633 Indiana Ave, NW Washington, DC, 20004, US		CODE 959P00	
17a. CONTRACTOR/OFFEROR MAXARTH, LLC 12215 FELLOWSHIP LN NORTH POTOMAC, MD, 208783402, US		CODE LOC829885289		FACILITY CODE		18a. PAYMENT WILL BE MADE BY PSA Pretrial Services Agency 633 Indiana Ave, NW, Suite 1134 Washington, DC, 20004, US	
TELEPHONE NO.				18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED <input checked="" type="checkbox"/> SEE ADDENDUM			
<input type="checkbox"/> 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER							
19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES			21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	See Schedule						
(Use Reverse and/or Attach Additional Sheets as Necessary)							
25. ACCOUNTING AND APPROPRIATION DATA See Schedule						26. TOTAL AWARD AMOUNT (For Govt. Use Only) \$254,858.40	
27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4, FAR 52.212-3 AND 52.212-5 ARE ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED							
27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4, FAR 52.212-5 IS ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED							
<input checked="" type="checkbox"/> 28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED				<input type="checkbox"/> 29. AWARD OF CONTRACT: REF. _____ OFFER DATED _____. YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:			
30a. SIGNATURE OF OFFEROR/CONTRACTOR 				31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER) Diana T. Weiss <small>Digitally signed by Diana T. Weiss DN: cn=Diana T. Weiss, o=Pretrial Services Agency, ou=Office of Finance and Administration, email=diana.weiss@psa.gov, c=US Date: 2017.08.23 07:28:18 -0400</small>			
30b. NAME AND TITLE OF SIGNER (Type or print) Avinash Bhati, PhD President Maxarth LLC		30c. DATE SIGNED 08/22/2017		31b. NAME OF CONTRACTING OFFICER (Type or print) Weiss, Diana T		8/23/2017	

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	See Schedule				

32a. QUANTITY IN COLUMN 21 HAS BEEN

☐ RECEIVED ☐ INSPECTED ☐ ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED: _____

32b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE	32c. DATE	32d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE
--------------------------------------------------------	-----------	---------------------------------------------------------------------

32e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE	32f. TELEPHONE NUMBER OF AUTHORIZED GOVERNMENT REPRESENTATIVE
	32g. E-MAIL OF AUTHORIZED GOVERNMENT REPRESENTATIVE

33. SHIP NUMBER	34. VOUCHER NUMBER	35. AMOUNT VERIFIED CORRECT FOR	36. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	37. CHECK NUMBER
-----------------	--------------------	---------------------------------	------------------------------------------------------------------------------------------------------------------	------------------

38. S/R ACCOUNT NO.	39. S/R VOUCHER NUMBER	40. PAID BY
---------------------	------------------------	-------------

41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT	42a. RECEIVED BY (Print)
41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER	42b. RECEIVED AT (Location)
41c. DATE	42c. DATE REC'D (YY/MM/DD)
	42d. TOTAL CONTAINERS

STANDARD FORM 1449 (REV. 3/2005) BACK

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Listing of Incorporated Purchase Requisitions

Incorporated Purchase Requisition Numbers:

PSA170218

Section B - Supplies or Services and Prices/Costs

Item Number	Base Item Number	Supplies/Services	Quantity	Unit
0001		Risk Assessment Revalidation	1	MS
Contract Type:Firm Fixed Price				
			Unit Price	\$254,858.40
			Extended Price	\$254,858.40
<p>Description: This requirement is for consulting services as further described in the Statement of Work, Section C.</p> <p>CONTRACT TYPE This is a FFP Contract for expert consultation services to review and enhance PSA's validated risk assessment instrument.</p> <p>PERIOD OF PERFORMANCE The period of performance shall be for 12 months following date of award.</p> <p>COMMUNICATION All communication shall be directed, in writing, to the attention of the Contracting Officer, Diana T. Weiss at diana.weiss@psa.gov and the Contracting Officer's Representative, Laura House at laura.house@psa.gov.</p>				
Purchase Requisitions		PSA170218		
			Funded Amount	\$254,858.40

Clauses incorporated by reference

None

Clauses incorporated by full text

B.1 About PSA

The Pretrial Services Agency for the District of Columbia (PSA) is a federal independent entity within the Court Services and Offender Supervision Agency (CSOSA). PSA has served the Nation's Capital for more than 45 years. The Agency assists judicial officers in both the Superior Court for the District of Columbia and the United States District Court for the District of

Columbia in formulating release recommendations and providing supervision and services to defendants awaiting trial that reasonably assure that those on conditional release return to court and do not engage in criminal activity. PSA has been a leader in the D.C. criminal justice system and has been recognized nationally for its pretrial drug testing and innovative supervision and treatment programs.

In support of its mission, PSA has a requirement for the supplies or services identified within this Section and as may further be described in Section C. Unless otherwise specifically stated elsewhere in this document, the contractor is to provide all supplies, equipment, tools, transportation, labor, supervision, and other items as may be necessary to provide the supplies or services identified

Section C - Description/Specifications/Work Statement

Clauses incorporated by reference

None

Clauses incorporated by full text

Statement of Work

PSA Risk Assessment Revalidation Study

Statement of Work

C.1 Introduction

The Pretrial Services Agency for the District of Columbia (PSA) was established by the National Capital Revitalization and Self-Government Improvement Act of 1997 as an independent entity within the Court Services and Offender Supervision Agency (CSOSA). CSOSA was certified as a federal agency within the Executive Branch in August 2000.

PSA assists judicial officers in both the Superior Court of the District of Columbia and the United States District Court for the District of Columbia by conducting a risk assessment for every arrested person who will be presented in court, identifying detention eligibility and formulating release recommendations, as appropriate, based upon the arrestee's demographic information, criminal history, and substance use and/or mental health information. For defendants who are placed on conditional release pending trial, PSA provides supervision and treatment services that reasonably assure that they return to court and do not engage in criminal activity pending their trial and/or sentencing.

In 2013, PSA began use of a validated risk assessment and now seeks to have its risk assessment protocols revalidated to ensure that they have retained their predictive validity.

C.2 Scope of Work/Services

The Contractor will:

1. Conduct an empirical study utilizing both quantitative and qualitative methods to determine whether PSA's current instrument appropriately considers relevant factors within the District of Columbia pretrial defendant population that are predictive of pretrial misconduct (defined as failure to appear for a scheduled court date or an arrest on a filed criminal or serious local ordinance charge; violent felony offense as defined by local statute; or domestic violence-related offense while on pretrial release.)
2. Conduct a specific analysis to determine whether additional dynamic factors should be considered and, if so,

whether PSA would benefit from re-assessing risk for defendants at regular intervals during the supervision period.

3. Conduct a specific analysis to determine the extent to which PSA's current instrument is free of predictive bias and yields average score differences between different groups based on race and gender (or other demographic characteristics available within the data set) and make recommendations for revising the instrument to minimize and/or eliminate any identified biases.
4. Conduct a specific analysis of defendants supervised on firearms-related charges to determine whether they present any increased risk of pretrial misconduct and, if so, what type.
5. Conduct a specific analysis of defendants who have tested positive for synthetic drugs to determine whether they present any increased risk of pretrial misconduct and, if so, what type.
6. Evaluate PSA's multi-dimensional release condition recommendation matrix and provide recommendations on revising the schematic, as appropriate, to align with results of the revalidation study.

The Contractor should also include in its analysis additional pretrial supervision components (e.g., initial orientation, regular contact, court date notification and verification, and responses to compliant and noncompliant behavior to include sanctions, incentives and revocations) potentially associated with reducing pretrial misconduct.

C.3 Background

PSA continuously reviews its risk assessment procedures to ensure consistency with the Agency's statutory mission of minimizing pretrial misconduct. These activities center on ensuring that the factors in PSA's risk assessment are predictive of future failure to appear in court and risk of rearrest during the pendency of each case. These activities also focus on which Agency release recommendations are the most effective ?but least restrictive ?for the pretrial defendant population. PSA restructured its risk assessment in 2013, and the tool now generates four (4) models to predict misconduct: global failure to appear, global rearrest, rearrest for a dangerous or violent offense, and rearrest for a domestic violence offense. This model is used for defendants arrested on a domestic violence offense only.

Even though average appearance and arrest-free rates for persons released to pretrial in Washington, DC remain stable at around 88 percent, respectively and less than two (2) percent are arrested on violent offenses. PSA continuously monitors and evaluates its risk assessment instrument and protocols to ensure continued success and identify emerging trends that may dictate changes.

In addition to several other areas of examination for the current risk assessment instrument analysis, three specific trends have emerged for which PSA now seeks to conduct further analysis:

Implicit Bias

In recent years, DC's criminal justice system and its principal stakeholders have placed an emphasis on identifying and eliminating or minimizing potential biases in the administration of justice. As such, PSA is committed to examining its risk assessment protocols to ensure that they are free of such partiality.

Synthetic Drugs

During October 2015, PSA introduced universal screening for synthetic cannabinoids. With nearly two years of data, PSA now seeks to determine whether use of these new psychoactive substances has any implications for risk management.

Firearms Offenses

The principal stakeholders within the District's criminal justice system have also placed increasing emphasis on non-fatal firearms offenses, such as discharging a firearm and assault with intent to kill. PSA now seeks to determine whether defendants arrested on these charges pose specific risks and, if so, how those risks can be best mitigated through supervision and case management.

C.4 Place of Performance

A substantial part of the work will be conducted at the Contractor's worksite. However, some work such as regular meetings and presentation with risk assessment workgroup members and other leadership and resources will require on-site meetings at PSA.

C.5 Period of Performance

The performance period is estimated to last for a 12 month period from the awarding of the contract.

C.6 Points of Contact:

Contracting Officer Representative

Laura E. House, Ph.D.
Senior Program Analyst
Pretrial Services Agency for the District of Columbia
Office of Strategic Development
202-442-1085
Laura.House@psa.gov

Contracting Officer

Diana T. Weiss
Pretrial Services Agency for the District of Columbia
Office of Finance and Administration
202-220-5654
Diana.Weiss@psa.gov

C.7 Technical Requirements

The Contractor shall:

1. Create a rigorous and well-defined quasi-experimental design to assess the predictive validity of PSA's risk assessment instrument. The design will include protocols for data collection timelines, control of extant variables, and detailed plans for the execution of the project. Central to this approach will be an evaluation of the four (4) models generated by the tool. Also critical to the contractor's work will be specific analyses of:
 - a. whether additional dynamic factors should be considered and, if so, whether PSA would benefit from re-assessing risk during the supervision period;
 - b. the extent to which PSA's current instrument controls for implicit bias in the areas of race, socioeconomic status, gender or other demographic factors;
 - c. whether defendants supervised on non-fatal firearms-related charges present any increased risk of pretrial misconduct and, if so, what type; and
 - d. Whether defendants who have tested positive for synthetic drugs present any increased risk of pretrial misconduct and, if so, what type.The contractor shall also develop a method to evaluate PSA's multi-dimensional release condition recommendation matrix and provide recommendations on revising the schematic, as appropriate, to align with results of the revalidation study. When completing the experimental design and corresponding analyses, the contractor shall conduct and rely upon relevant literature reviews related to pretrial risk assessment, specifically those related to identification and minimization of implicit bias.
2. In collaboration with PSA staff and a project-specific advisory group, participate in a 1-3 month planning phase at the beginning of the contract. The primary goals of the planning phase will be to: review the current risk assessment and scoring protocols and gain insight into the internal operations of PSA by meeting with PSA staff and a project-specific advisory group and others to identify issues that should be considered during the revalidation process.
3. Present the proposed research design to PSA for final review and approval.
4. Following approval of the research design, conduct the evaluation in collaboration PSA staff The role of PSA staff in this context is limited to provision of required data sets and background information. within the project's budget and time constraints.

5. Present a report with findings from the evaluation design to PSA management, the project advisory group, and select PSA and external groups.
6. Develop a final report, including findings and recommendations for the enumerated analyses and research questions contained within this statement of work.

Methodology Assumptions

1. PSA believes that an experimental design with randomly assigned treatment and control groups is not possible here. Given this, the Contractor must develop a research design sufficient enough to address the research questions. At a minimum, the design must include techniques to determine and evaluate the predictive validity of PSA's current instrument to measure global failure to appear, global rearrest, rearrest for a dangerous or violent offense, and rearrest for a domestic violence offense. For defendants arrested on domestic violence charges only.
2. The data that will be used for the analysis will come primarily from PSA's Pretrial Real-time Information System Manager (PRISM). However, the Contractor will be expected to utilize other methods, as appropriate, to collect data that will not only supplement but enhance the study.

PRISM contains the following information:

1. Data on PSA's current risk assessment variables
2. Detailed demographic Information
3. Criminal history
4. Drug use
5. Supervision conditions
6. Compliance data
7. Scheduled hearing dates
8. Appearance and nonappearance at each hearing
9. All recorded rearrests
10. Dispositions and disposition dates.

The Contractor should expect to routinely work on-site with PSA staff for periods during the 1-3 month planning phase to gain better insight into the agency and its programs and construct suitable evaluation and validation samples.

C.8 Contractor Key Personnel

All contractor personnel provided in support of this contract shall be considered key personnel.

C.9 Deliverables

- a. The Contractor shall provide the following deliverables:

Deliverable	Frequency of Delivery	PSA Point of Contact
Quarterly Status Reports	By 5:00 pm on the last business day of every third month	Contracting Officer's Representative (COR)
Research Design, including Evaluation Model and Data Collection Strategy	120 days of Contract Award	COR
Final Evaluation Report: The Final Report will describe the analysis, present tables of results, and finalized drafts of risk assessment instruments.	End of Contract Period ? prior to final invoice.	COR
Presentation of Evaluation Results to PSA Management (deliverable requires COR review and approval before	As scheduled by contractor and COR	COR

submission to PSA Management)		
Presentation of Evaluation Results to Selected PSA Staff	As scheduled by contractor and COR	COR
Presentation of Evaluation Results to Select External Partners	As scheduled by contractor and COR	COR
Final Report	Within 12 months of contract start	COR

- b. Deliverables shall be provided in a timely manner as listed above. Electronic copies of all deliverables will be provided to the contracting officer and the COR.

C.10 Government Responsibilities

- a. PSA will provide the Contractor's personnel access to the Agency Information Technology System after completion of appropriate security background checks.
- b. PSA will grant Contractor personnel security approvals (provided Contractor personnel meet specific Federal security requirements) or escorts, as required, to access the site for service delivery and provide access to all areas where equipment is installed.

C.11 Rights of Egress and Ingress

During the life of this contract, the rights of ingress to and egress from any PSA facility for the Contractor shall be made available, as required. During all operation on Government premises, the Contractor shall comply with the rules and regulations governing the conduct of personnel and the operation of the facility.

C.12 Government-Contractor Relationships

- a. The Government and the Contractor understand and agree that the support services to be delivered under this contract by the Contractor are non-personal services and the parties recognize and agree that no employer-employee relationships exist or will exist under the contract between the Government and the Contractor and/or between the Government and Contractor's employees. It is, therefore, in the best interest of the Government to afford the parties a full and complete understanding of their respective obligations.
- b. Contractor personnel under this contract shall not:
1. be placed in a position where they are appointed or employed by a Federal employee or are under the supervision, direction or evaluation of a Federal employee;
 2. be placed in a staff or policy making position; or
 3. Be placed in a position of supervision, direction or evaluation over PSA personnel or personnel of other contractors, or become part of a Government organization.
- c. The services to be performed under this contract do not require the Contractor or its employees to exercise personal judgment and discretion on behalf of the Government. Rules, regulations, directions, and requirements, which are issued by PSA Management under their responsibility for good order, administration, and security are applicable to all personnel who enter a Government installation. This is not construed or interpreted to establish any degree of Government control, which is inconsistent with a non-personal services contract.
- d. The Contractor will not be paid for performance of personal services.

C.13 Limitations and Constraints

The Contractor shall comply with the following limitation and constraints of the contract.

- a. The Contractor shall not disclose sensitive or proprietary information of, or in the possession of, PSA contractors or business partners to unauthorized persons. The Contractor shall be the subject to any and all penalties by law for unlawful disclosure of PSA information.
- b. The Contractor is required to abide by PSA's guidance for protecting sensitive information and proprietary information. Any such information made available in any format shall be used only for the purpose of carrying out the provisions of the agreement. Such information shall not be divulged or made known in any manner to any unauthorized person. The Contractor shall not remove any sensitive material from Government sites without Government approval. The Contractor shall immediately notify the COR upon discovery of any inadvertent disclosures of information.

C.14 GENERAL REQUIREMENTS AND GUIDANCE

a. Written requirements

The Offeror's proposal should address the following:

- Project understanding and approach. Describe your understanding of the project and your proposed approach.
- Key Personnel. Identify any key personnel proposed for this project. Offeror should include resumes for key personnel. Clearly identify the principle and secondary project staff, the university or entity for which they work, and their capabilities for performing the identified work.
- Recommendations for potential data analyses and special reports.
- Methods for ensuring data integrity and security
- Firm Fixed Price for providing services identified in the Statement of Work
- Detailed description of project benchmarks, how achievement will be measured, and an approximate timeline for achieving each benchmark.

Proposals must be detailed enough to permit realistic evaluation of the goals, scope, and technical content.

Proposals must be single-sided with at least a one inch margin in Times New Roman, 12 point font.

Proposal should include:

- i. Abstract
 1. A one-page summary of purpose, objectives, actions taken and anticipated results.
- ii. **Program Narrative (not to exceed 25 double-spaced pages)**
 1. The Program Narrative includes:
 - a. Abstract
 - b. Table of Contents
 - c. Main body:
 - i. Purpose, goals and objectives.
 - ii. Review of relevant literature.
 - iii. Methodology
 - iv. Work development plan and organization.
 - v.
 - vi. Dissemination strategy
 - d. Appendices (Not counted against the solicitation page limit):
 - i. Bibliography and References.
 - ii. List of key personnel.
 - iii. Resumes of key personnel.
 - e. Letters of cooperation from organizations cooperating in the project (if applicable).
 - f. Timeline and milestones.

b. Delivery of final draft

The contractor must have a draft of the final report to PSA within one (1) year, or twelve (12) months of the contract start.

c. Project Milestones (Estimated)

Table 1

Task	Activity	Due Date
1	Convene initial contract kick-off meeting	9/7/2017
2	Review of current risk assessment instrument findings and	

	related documents	9/14/2017
4	Develop research design and plan and present to PSA	9/30/2017
5	Hold meetings with PSA COR and leadership regarding research plan	10/10/2017
5	Data acquisition and processing	10/24/2017
6	Part I (Analysis): Conduct research and present findings (i.e. design risk models, model estimation and validation; add new risk factors- synthetic drugs and firearms)	1/24/2018
7	Part II (Analysis): Evaluate PSA's multi-dimensional release condition recommendation matrix and provide recommendations on revising the schematic, as appropriate, to align with results of the revalidation study.	3/24/2018
8	Part III (Analysis): Examine implicit bias in instrument and develop strategies to eliminate implicit bias in race, gender and other demographic factors in instrument	6/24/2018
11	Write and submit final report with recommendations to PSA	7/24/2018
9	Review and present overall study findings to PSA leadership	8/10/2018
10	Implementation consultation with PSA leadership and key staff (i.e. Operations, OIT)	9/1/2018

C.15 Performance Measurement and Quality Standards

Table 2

Deliverable	Performance Standard	Acceptable Quality Level	Monitoring Method
Quarterly status reports by 5:00 pm on the last business day of every third month; Meet with the COR and relevant staff by telephone quarterly to check the status and progress of the project	Brief progress report; quarterly meetings held	95-100% of meetings are held consistently every third month	COR feedback
Research design, including evaluation model and data collection strategy 120 days of contract award	Written report	100%- comprehensive report addressing all areas is submitted	COR review and feedback
Presentation of Evaluation Results to PSA management (deliverable requires COR review and approval before submission to PSA management) as scheduled by contractor and COR	Verbal presentation and power point slides	100%- in-person, verbal presentation and power point slides presented	COR and PSA senior leadership feedback
Presentation of evaluation results to selected PSA staff as scheduled by contractor and COR	Verbal presentation	100%- in- person, verbal presentation and meeting	COR and selected PSA staff feedback
Presentation of evaluation results to selected external partners as scheduled by contractor and COR	Verbal presentation	100%- in-person presentation and meetings	COR feedback
Final report within 12 months of contract start. The final report will describe the analysis, present tables of results, and finalized drafts of risk assessment instruments. End of contract period ? prior to final invoice.	Written report	100%- comprehensive report	COR review and feedback

Section D - Packaging and Marking

None

Section E - Inspection and Acceptance Terms

None

Clauses incorporated by reference

None

Clauses incorporated by full text

E.1 Inspection and Acceptance

Unless otherwise stated in this Contract, the Contracting Officer's Representative (COR) will be responsible for inspection and acceptance of the products/services furnished under this Contract.

E.2 Quality Assurance

A Quality Assurance Surveillance Plan (QASP) will be incorporated into the contract. The Government will evaluate the Contractor's performance under this contract using the method of surveillance deemed appropriate. If the Contracting Officer and/or Contracting Officer's Representative reveals contract terms and/or conditions are not being met, the discrepancy will be brought to the attention of the Contractor for correction.

If the Contractor fails to correct any deficiencies under the contract, the Government shall have the right to (1) require the Contractor to immediately take all the necessary steps to ensure performance of the service in conformity with the requirements of the contract, and (2) reduce the monthly fee payable under the contract by the amount to reflect the reduced value at the services performed, or (3) have the necessary work accomplished by the Government forces or other means, and reduce the Contractor's payment in the amount of the expenses incurred.

QUALITY ASSURANCE SURVEILLANCE PLAN (QASP)

Note: the following Quality Assurance Surveillance Plan (QASP) is PSA's codification of its method of implementing FAR 37.601, which requires that performance-based contracts or task orders-

- a) Describe the requirements in terms of results required rather than the methods of performance of the work;
- b) Use measurable performance standards (i.e., in terms of quality, timeliness, quantity, etc.) and quality assurance surveillance plans;
- c) Specify procedures for reductions of fee or for reductions to the price of a fixed-price contract when services are not performed or do not meet contract requirements; and
- d) Include performance incentives where appropriate.

Offeror's must complete the QASP as part of their proposal. A description of the columns and information to be entered follows below.

We will use the information provided as part of our evaluation of your offer.

- (1) Deliverable: One of the deliverables described in the "Deliverables" section above.

- (2) Performance Standard: The level of performance which the Government considers acceptable. A good performance standard in general should:

- § Measure important things;
- § Be simple, but not too simple;
- § Be auditable and capable of validation (quantifiable measures preferred, as they are less subjective);
- § Attainable and worth the cost;
- § Have a level of detail that corresponds to the intent of the stated measure and expectation;
- § Be consistently combined with other measures to reflect corporate priorities; and
- § Be controlled by the contractor.

- (3) Acceptable Quality Level: The range of deviation?if any?in which the Government will consider performance to be acceptable. Each Offeror must propose an Acceptable Quality Level (AQL) for each performance standard for each deliverable. If the selected Offeror fails to achieve stated AQLs, PSA will reduce the offeror's payment for the services rendered in accordance with the disincentive formula. You must enter the AQLs for each deliverable in the Performance Requirements Summary Template for each deliverable that has a performance standard.

(4) Monitoring Method

(a) This is the method PSA will use to monitor performance and determine the extent to which performance has met the standard. Offeror's are encouraged to propose a sound process for verifying the accuracy of performance data on a continuing or recurring basis. Regardless of the method or degree of monitoring, we reserve the right to audit all performance data to independently verify its accuracy.

(b) In general, we prefer monitoring methods that automatically capture measurements as part of the process and do not place a burden on either the Offeror or PSA to collect and analyze data.

(5) Performance Incentive / Reduction

(a) For each AQL, your proposal must specify a maximum price reduction that will take effect if you fail to meet the AQL. The proposal must also specify the formulas and decision criteria that we will use to calculate the actual amount of the price reduction for the related CLIN. PSA is willing to consider proposals that include non-monetary disincentives, such as unfavorable performance evaluation, or other form of consideration.

(b) PSA will consider non-monetary incentives for performance that exceeds the AQL. Examples of non-monetary incentives may include:

- Revised schedule
- Reduced oversight
- Positive performance evaluation

(c) Your selection of AQLs, incentive formula and price reduction formula will be important to our evaluation. Your response must specify the proposed method for measuring your performance against each performance standard, which we will compare to relevant industry benchmarks.

Performance Requirement Summary Template

Deliverable	Performance Standard	Acceptable Quality Level (AQL)	Monitoring Method	Performance Incentive/Reduction
Quarterly status reports by 5:00 pm on the last business day of every third month; Meet with COR and relevant staff by telephone quarterly to check the status and progress of the project.	Brief progress report; Quarterly meetings held.	95-100% of meetings are held consistently every third month.	COR feedback.	Revised schedule or positive/negative performance evaluation.
Research design, including evaluation model and data collection strategy.	Written report.	100% comprehensive report addressing all areas is submitted.	COR review and feedback.	Revised schedule or positive/negative performance evaluation.
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation and power point slides.	100% in person verbal presentation and power point slides.	COR and PSA Leadership feedback.	Revised schedule or positive/negative performance evaluation.
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation.	100% in person verbal presentation and meeting.	COR and select PSA staff feedback.	Revised schedule or positive/negative performance evaluation.

Deliverable	Performance Standard	Acceptable Quality Level (AQL)	Monitoring Method	Performance Incentive/Reduction
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation.	100% in person verbal presentation and meeting.	COR feedback.	Revised schedule or positive/negative performance evaluation.
Final report within 12 months of contract award. Report will describe analysis, present tables of results, finalized recommended risk assessment instrument, recommendation matrix, and predictive bias findings.	Written report.	100% comprehensive report.	COR review and feedback.	Revised schedule or positive/negative performance evaluation.

Section F - Delivery or Performance

Line Item: 0001

Period Of Performance Start Date	Period Of Performance End Date	Period Of Performance Address
9/7/17	9/6/18	PSA Pretrial Services Agency 633 Indiana Ave, NW Suite 1134 Washington DC US 20004

Clauses incorporated by reference

None

Clauses incorporated by full text

None

Section G - Contract Administration Data

Total Obligated Amount:\$254,858.40

The Obligated Amount is broken down by line of accounting as follows:

LOA:2017 1734A1717D RACSRV000000 1401010500 NA 251100 999996 9999 NA NA NA NA
Amount:\$254,858.40
Clin 0001:\$254,858.40

Requesting Office Address
PSA Pretrial Services Agency 633 Indiana Ave, NW Suite 1134 Washington DC 20004

Phone:
Contact Details:
House, Laura
Phone: 202.442.1085 Email: Laura.House@psa.gov

Fax:

COTR Office Address

PSA Pretrial Services Agency
633 Indiana Ave, NW
Suite 1134
Washington DC 20004
Phone:
Contact Details:
House, Laura
Phone: 202.442.1085 Email: Laura.House@psa.gov

Fax:

Issuing Office Address

PSA Pretrial Services Agency
633 Indiana Ave, NW
Suite 1134
Washington DC 20004
Phone:
Contact Details:
Weiss, Diana T
diana.weiss@psa.gov

Fax:

Submit Invoices To Address

PSA ACCT PAY
PRETRIAL SERVICES AGENCY
633 INDIANA AVE NW; SUITE 1120
WASHINGTON DC 20004
Phone:
Contact Details:

Fax:

Administration Office Address

PSA Pretrial Services Agency
633 Indiana Ave, NW
Suite 1134
Washington DC 20004
Phone:
Contact Details:
Weiss, Diana T
diana.weiss@psa.gov

Fax:

Remit To Office Address

PSA Pretrial Services Agency
633 Indiana Ave, NW
Suite 1134
Washington DC 20004
Phone:
Contact Details:

Fax:

Small Business Admin Office Address

PSA Pretrial Services Agency
633 Indiana Ave, NW

Suite 1134
Washington DC 20004
Phone:
Contact Details:
Weiss, Diana T
diana.weiss@psa.gov

Fax:

Clauses incorporated by reference

None

Clauses incorporated by full text

G.2 Commitment of Public Funds

The Contracting Officer is the only individual who can legally commit the Government to the expenditure of public funds in connection with the proposed acquisition. Any other commitment made, either explicit or implied, is invalid.

Section H - Special Contract Requirements

Clauses incorporated by reference

None

Clauses incorporated by full text

Payment Schedule

Payment Schedule

Payment #	Invoice Date	Amount	Tasks completed
1	30-Sep-17		Kick-off meeting and analysis plan submitted.
2	31-Oct-17		Data acquired, processed, and tested for adequacy.
3	30-Nov-17		RAI revalidation initial findings shared with PSA.
4	31-Dec-17		Recommendation matrix review and analysis plan submitted.
5	31-Jan-18		RAI revalidation in-person presentation.
6	28-Feb-18		Recommendation matrix initial findings shared with PSA.
7	31-Mar-18		Recommendation matrix analysis in-person presentation.
8	30-Apr-18		Predictive bias initial findings shared with PSA.
9	31-May-18		Predictive bias alternate strategies shared with PSA.
10	30-Jun-18		Predictive bias analysis in-person presentation.
11	31-Jul-18		Comprehensive final report submitted.
12	31-Aug-18		Comprehensive final in-person presentation to stakeholders.
13	30-Sep-18		Implementation consultation completed.

Total

Section I - Contract Clauses

Clauses incorporated by reference

Article Number	Reference Text
52.212-4	52.212-4 Contract Terms and Conditions-Commercial Items (JAN 2017)
52.203-16	52.203-16 Preventing Personal Conflicts of Interest (DEC 2011)
52.228-5	52.228-5 Insurance-Work on a Government Installation (JAN 1997)
52.243-3	52.243-3 Changes-Time-and-Materials or Labor-Hours (SEPT 2000)
52.246-6	52.246-6 Inspection-Time-and-Material and Labor-Hour (APR 2015)
52.219-6	52.219-6 Notice of Total Small Business Set-Aside (NOV 2011)

Clauses incorporated by full text

52.212-05 52.212-5 Contract Terms and Conditions Required to Implement Statutes or Executive Orders-Commercial Items.

Contract Terms and Conditions Required to Implement Statutes or Executive Orders -- Commercial Items (Jan 2017)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

- (1) 52.203-19, Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements (Jan 2017) (section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act 2015 (Pub. L. 113-235) and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions)).
- (2) 52.209-10, Prohibition on Contracting with Inverted Domestic Corporations (Nov 2015)
- (3) 52.233-3, Protest After Award (AUG 1996) (31U.S.C. 3553).
- (4) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004) (Public Laws 108-77, 108-78 (19 U.S.C. 3805 note)).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the contracting officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

[Contracting Officer Check as appropriate.]

- ___ (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (Sept 2006), with Alternate I (Oct 1995) (41 U.S.C. 4704 and 10 U.S.C. 2402).
- ___ (2) 52.203-13, Contractor Code of Business Ethics and Conduct (Oct 2015) (41 U.S.C. 3509).
- ___ (3) 52.203-15, Whistleblower Protections under the American Recovery and Reinvestment Act of 2009 (Jun 2010) (Section 1553 of Pub L. 111-5) (Applies to contracts funded by the American Recovery and Reinvestment Act of 2009).
- ___ (4) 52.204-10, Reporting Executive compensation and First-Tier Subcontract Awards (Oct 2016) (Pub. L. 109-282) (31 U.S.C. 6101 note).
- ___ (5) [Reserved]

- ☐ (6) 52.204-14, Service Contract Reporting Requirements (Oct 2016) (Pub. L. 111-117, section 743 of Div. C).
- ☐ (7) 52.204-15, Service Contract Reporting Requirements for Indefinite-Delivery Contracts (Oct 2016) (Pub. L. 111-117, section 743 of Div. C).
- ☐ (8) 52.209-6, Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment (Oct 2015) (31 U.S.C. 6101 note).
- ☐ (9) 52.209-9, Updates of Publicly Available Information Regarding Responsibility Matters (Jul 2013) (41 U.S.C. 2313).
- ☐ (10) [Reserved]
- ☐ (11) (I) 52.219-3, Notice of HUB Zone Set-Aside or Sole-Source Award (Nov 2011) (15 U.S.C. 657a).
- ☐ (ii) Alternate I (Nov 2011) of 52.219-3.
- ☐ (12) (I) 52.219-4, Notice of Price Evaluation Preference for HUB Zone Small Business Concerns (Oct 2014) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).
- ☐ (ii) Alternate I (Jan 2011) of 52.219-4.
- ☐ (13) [Reserved]
- ☒ (14) (I) 52.219-6, Notice of Total Small Business Set-Aside (Nov 2011) (15 U.S.C. 644).
- ☐ (ii) Alternate I (Nov 2011).
- ☐ (iii) Alternate II (Nov 2011).
- ☐ (15) (I) 52.219-7, Notice of Partial Small Business Set-Aside (June 2003) (15 U.S.C. 644).
- ☐ (ii) Alternate I (Oct 1995) of 52.219-7.
- ☐ (iii) Alternate II (Mar 2004) of 52.219-7.
- ☐ (16) 52.219-8, Utilization of Small Business Concerns (Nov 2016) (15 U.S.C. 637(d) (2) and (3)).
- ☐ (17) (I) 52.219-9, Small Business Subcontracting Plan (Jan 2017) (15 U.S.C. 637 (d) (4)).
- ☐ (ii) Alternate I (Nov 2016) of 52.219-9.
- ☐ (iii) Alternate II (Nov 2016) of 52.219-9.
- ☐ (IV) Alternate III (Nov 2016) of 52.219-9.
- ☐ (v) Alternate IV (Nov 2016) of 52.219-9.
- ☐ (18) 52.219-13, Notice of Set-Aside of Orders (Nov 2011) (15 U.S.C. 644(r)).
- ☐ (19) 52.219-14, Limitations on Subcontracting (Jan 2017) (15 U.S.C. 637(a) (14)).
- ☐ (20) 52.219-16, Liquidated Damages?SubcontractingPlan (Jan 1999) (15 U.S.C. 637(d) (4) (F) (I)).

- ___ (21) 52.219-27, Notice of Service-Disabled Veteran-Owned Small Business Set-Aside (Nov 2011) (15 U.S.C. 657f).
- ___ (22) 52.219-28, Post Award Small Business Program Representation (Jul 2013) (15 U.S.C. 632(a) (2)).
- ___ (23) 52.219-29, Notice of Set-Aside for, or Sole Source Award to, Economically Disadvantaged Women-Owned Small Business Concerns (Dec 2015) (15 U.S.C. 637(m)).
- ___ (24) 52.219-30, Notice of Set-Aside for, or Sole Source Award to, Women-Owned Small Business Concerns Eligible under the Women-Owned Small Business Program (Dec 2015) (15 U.S.C. 637(m)).
- _X_ (25) 52.222-3, Convict Labor (June 2003) (E.O.11755).
- _X_ (26) 52.222-19, Child Labor?Cooperationwith Authorities and Remedies (Oct 2016) (E.O. 13126).
- _X_ (27) 52.222-21, Prohibition of Segregated Facilities (Apr 2015).
- _X_ (28) 52.222-26, Equal Opportunity (Sep 2016) (E.O. 11246).
- ___ (29) 52.222-35, Equal Opportunity for Veterans (Oct 2015) (38 U.S.C. 4212).
- ___ (30) 52.222-36, Equal Opportunity for Workers with Disabilities (Jul 2014) (29 U.S.C. 793).
- ___ (31) 52.222-37, Employment Reports on Veterans (Feb 2016) (38 U.S.C. 4212).
- ___ (32) 52.222-40, Notification of Employee Right under the National Labor Relations Act (Dec 2010) (E.O. 13496).
- ___ (33) (I) 52.222-50, Combating Trafficking in Persons (Mar 2015) (22 U.S.C. chapter 78 and E.O. 13627).
- ___ (ii) Alternate I (Mar 2015) of 52.222-50, (22U.S.C. chapter 78 and E.O. 13627).
- ___ (34) 52.222-54, Employment Eligibility Verification (Oct 2015). (E. O. 12989). (Not applicable to the acquisition of commercially available off-the-shelf items or certain other types of commercial items as prescribed in 22.1803.)
- ___ (35) 52.222-59, Compliance with Labor Laws (Executive Order 13673) (Oct 2016). (Applies at \$50 million for solicitations and resultant contracts issued from October 25, 2016 through April 24, 2017; applies at \$500,000 for solicitations and resultant contracts issued after April 24, 2017).
- Note to paragraph (b) (35):** By a court order issued on October 24, 2016, 52.222-59 is enjoined indefinitely as of the date of the order. The enjoined paragraph will become effective immediately if the court terminates the injunction. At that time, DOD, GSA, and NASA will publish document in the Federal Register advising the public of the termination of the injunction.
- ___ (36) 52.222-60, Paycheck Transparency (Executive Order 13673) (Oct 2016).
- ___ (37) (I) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Items (May 2008) (42 U.S.C.6962(c) (3) (A) (ii)). (Not applicable to the acquisition of commercially available off-the-shelf items.)
- ___ (ii) Alternate I (May 2008) of 52.223-9 (42U.S.C. 6962(I) (2) (C)). (Not applicable to the acquisition of commercially available off-the-shelf items.)
- ___ (38) 52.223-11, Ozone-Depleting Substances and High Global Warming Potential Hydrofluorocarbons (Jun 2016) (E.O.13693).

___ (39) 52.223-12, Maintenance, Service, Repair, or Disposal of Refrigeration Equipment and Air Conditioners (Jun 2016) (E.O.13693).

___ (40) (I) 52.223-13, Acquisition of EPEAT®-Registered Imaging Equipment (Jun 2014) (E.O.s 13423 and 13514

___ (ii) Alternate I (Oct 2015) of 52.223-13.

___ (41) (I) 52.223-14, Acquisition of EPEAT®-Registered Television (Jun 2014) (E.O.s 13423 and 13514).

___ (ii) Alternate I (Jun 2014) of 52.223-14.

___ (42) 52.223-15, Energy Efficiency in Energy-Consuming Products (Dec 2007) (42 U.S.C. 8259b).

___ (43) (I) 52.223-16, Acquisition of EPEAT®-Registered Personal Computer Products (Oct 2015) (E.O.s 13423 and 13514).

___ (ii) Alternate I (Jun 2014) of 52.223-16.

X (44) 52.223-18, Encouraging Contractor Policies to Ban Text Messaging while Driving (Aug 2011) (E.O. 13513).

___ (45) 52.223-20, Aerosols (Jun 2016) (E.O.13693).

___ (46) 52.223-21, Foams (Jun 2016) (E.O. 13696).

___ (47) (I) 52.224-3, Privacy Training (Jan 2017) (5 U.S.C. 552a).

___ (ii) Alternate I (Jan 2017) of 52.224-3.

___ (48) 52.225-1, Buy American--Supplies (May2014) (41 U.S.C. chapter 83).

___ (49) (I) 52.225-3, Buy American--Free Trade Agreements--Israeli Trade Act (May 2014) (41 U.S.C. chapter 83, 19 U.S.C. 3301note, 19 U.S.C. 2112 note, 19 U.S.C. 3805 note, 19 U.S.C. 4001 note, Pub. L.103-182, 108-77, 108-78, 108-286, 108-302, 109-53, 109-169, 109-283, 110-138,112-41, 112-42, and 112-43).

___ (ii) Alternate I (May 2014) of 52.225-3.

___ (iii) Alternate II (May 2014) of 52.225-3.

___ (IV) Alternate III (May 2014) of 52.225-3.

___ (50) 52.225-5, Trade Agreements (Oct 2016) (19U.S.C. 2501, *et seq.*, 19 U.S.C. 3301 note).

___ (51) 52.225-13, Restrictions on Certain Foreign Purchases (Jun 2008) (E.O.'s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).

___ (52) 52.225-26, Contractors Performing Private Security Functions outside the United States (Oct 2016) (Section 862, as amended, of the National Defense Authorization Act for Fiscal Year 2008; 10U.S.C. 2302 Note).

___ (53) 52.226-4, Notice of Disaster or Emergency Area Set-Aside (Nov 2007) (42 U.S.C. 5150).

___ (54) 52.226-5, Restrictions on Subcontracting Outside Disaster or Emergency Area (Nov 2007) (42 U.S.C. 5150).

___ (55) 52.232-29, Terms for Financing of Purchases of Commercial Items (Feb 2002) (41 U.S.C. 4505), 10 U.S.C.

2307(f)).

___ (56) 52.232-30, Installment Payments for Commercial Items (Jan 2017) (41 U.S.C. 4505, 10 U.S.C. 2307(f)).

X (57) 52.232-33, Payment by Electronic Funds Transfer?System for Award Management (Jul 2013) (31 U.S.C. 3332).

___ (58) 52.232-34, Payment by Electronic Funds Transfer?OtherThan System for Award Management (Jul 2013) (31 U.S.C. 3332).

___ (59) 52.232-36, Payment by Third Party (May2014) (31 U.S.C. 3332).

___ (60) 52.239-1, Privacy or Security Safeguards (Aug 1996) (5 U.S.C. 552a).

___ (61) 52.242-5, Payments to Small Business Subcontractors (Jan 2017) (15 U.S.C. 637(d) (12)).

___ (62) (i) 52.247-64, Preference for Privately-owned U.S.-Flag Commercial Vessels (Feb 2006) (46 U.S.C. Appx 1241(b) and 10U.S.C. 2631).

___ (ii) Alternate I (Apr 2003) of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c),applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or executive orders applicable to acquisitions of commercial items:

[Contracting Officer Check as appropriate.]

___ (1) 52.222-17, No displacement of Qualified Workers (May 2014) (E.O. 13495)

___ (2) 52.222-41, Service Contract Labor Standards (May 2014) (41 U.S.C. chapter 67.).

___ (3) 52.222-42, Statement of Equivalent Rates for Federal Hires (May 2014) (29 U.S.C. 206 and 41 U.S.C. chapter 67).

___ (4) 52.222-43, Fair Labor Standards Act and Service Contract Labor Standards -- Price Adjustment (Multiple Year and Option Contracts) (May 2014) (29 U.S.C.206 and 41 U.S.C. chapter 67).

___ (5) 52.222-44, Fair Labor Standards Act and Service Contract Labor Standards -- Price Adjustment (May 2014) (29 U.S.C. 206and 41 U.S.C. chapter 67).

___ (6) 52.222-51, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (May 2014) (41 U.S.C. chapter 67).

___ (7) 52.222-53, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services--Requirements (May 2014) (41 U.S.C. chapter 67).

___ (8) 52.222-55, Minimum Wages under Executive Order 13658 (Dec 2015) (E.O. 13658).

___ (9) 52.222-62, Paid Sick Leave under Executive Order 13706 (JAN 2017) (E.O. 13706).

___ (10) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations. (May 2014) (42 U.S.C. 1792).

(d) *Comptroller General Examination of Record* The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain

the clause at 52.215-2, Audit and Records --Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e)

(1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c) and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in this paragraph (e)(1) in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause?

(i) 52.203-13, Contractor Code of Business Ethics and Conduct (Oct 2015) (41 U.S.C. 3509).

(ii) 52.203-19, Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements (Jan 2017) (section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235) and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions)).

(iii) 52.219-8, Utilization of Small Business Concerns (Nov 2016) (15 U.S.C. 637(d) (2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$700,000 (\$1.5 million for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(iv) 52.222-17, No displacement of Qualified Workers (May 2014) (E.O. 13495). Flow down required in accordance with paragraph (1) of FAR clause 52.222-17.

(v) 52.222-21, Prohibition of Segregated Facilities (Apr 2015).

(vi) 52.222-26, Equal Opportunity (Sep 2016) (E.O. 11246).

(vii) 52.222-35, Equal Opportunity for Veterans (Oct 2015) (38 U.S.C. 4212).

(viii) 52.222-36, Equal Opportunity for Workers with Disabilities (Jul 2014) (29 U.S.C. 793).

(ix) 52.222-37, Employment Reports on Veterans (Feb 2016) (38 U.S.C. 4212).

(x) 52.222-40, Notification of Employee Right under the National Labor Relations Act (Dec 2010) (E.O. 13496). Flow down required in accordance with paragraph (f) of FAR clause 52.222-40.

(xi) 52.222-41, Service Contract Labor Standards (May 2014), (41 U.S.C. chapter 67).

(xii) (A) 52.222-50, Combating Trafficking in Persons (Mar 2015) (22 U.S.C. chapter 78 and E.O. 13627).

(B) Alternate I (Mar 2015) of 52.222-50 (22 U.S.C. chapter 78 E.O. 13627).

(xiii) 52.222-51, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (May 2014) (41 U.S.C. chapter 67.)

(xiv) 52.222-53, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services--Requirements (May 2014) (41 U.S.C. chapter 67)

(xv) 52.222-54, Employment Eligibility Verification (Oct 2015) (E. O. 12989).

(xvi) 52.222-55, Minimum Wages under Executive Order 13658 (Dec 2015).

(xvii) 52.222-59, Compliance with Labor Laws(Executive Order 13673) (Oct 2016) (Applies at \$50 million for solicitations and resultant contracts issued from October 25, 2016 through April 24, 2017; applies at \$500,000 for solicitations and resultant contracts issued after April 24, 2017).

Note to paragraph (e) (1) (xvii): By a court order issued on October 24, 2016, 52.222-59 is enjoined indefinitely as of the date of the order. The enjoined paragraph will become effective immediately if the court terminates the injunction. At that time, DOD, GSA, and NASA will publish a document in the Federal Register advising the public of the termination of the injunction.

(xviii) 52.222-60, Paycheck Transparency (Executive Order 13673) (Oct 2016).

(xix) 52.222-62, Paid sick Leave under Executive Order 13706 (JAN 2017) (E.O. 13706).

(xx) (A) 52.224-3, Privacy Training (Jan 2017) (5U.S.C. 552a).

(B) Alternate I (Jan 2017) of 52.224-3.

(xxi) 52.225-26, Contractors Performing Private Security Functions outside the United States (Oct 2016) (Section 862, as amended, of the National Defense Authorization Act for Fiscal Year 2008; 10 U.S.C. 2302Note).

(xxii) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations. (May 2014) (42 U.S.C. 1792). Flow down required in accordance with paragraph (e) of FAR clause 52.226-6.

(xxiii) 52.247-64, Preference for Privately-Owned U.S. Flag Commercial Vessels (Feb 2006) (46 U.S.C. Appx 1241(b) and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.

(2) While not required, the Contractor may include in its subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(End of Clause)

52.217-8

52.217-8 Option to Extend Services (NOV 1999)

The Government may require continued performance of any services within the limits and at the rates specified in the contract. These rates may be adjusted only as a result of revisions to prevailing labor rates provided by the Secretary of Labor. The option provision may be exercised more than once, but the total extension of performance hereunder shall not exceed 6 months. The Contracting Officer may exercise the option by written notice to the Contractor within 60 Days.

(End of clause)

PSA200-70

On-Site Working Conditions (SEP 2013)

(a) PSA facilities are smoking restricted workplaces. Due to the nature of the work, facilities, and requirements, contractor staff may only smoke outside in designated smoking areas.

(b) Unless otherwise specified elsewhere in the contract documents, the normal operating hours are between 7:00 am to 5:30 pm, Monday through Friday.

(c) Government personnel observe the following days as holidays:

New Year's Day	January 1 *
Martin Luther King's Birthday	Third Monday in January
President's Day	Third Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4*
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Veterans Day	November 11
Thanksgiving Day	Fourth Thursday in November
Christmas Day	December 25*

* If the date falls on a Saturday, the Government holiday is the preceding Friday. If the date falls on a Sunday, the Government holiday is the following Monday.

(d) In addition to the days designated as holidays, the Government observes the following days:

- Any other day designated by Federal Statute
- Any other day designated by Executive Order
- Presidential Inauguration Day
- Any other day designated by the President's Proclamation

(e) It is understood and agreed between the Government and the Contractor that observance of such days by Government personnel shall not otherwise be a reason for an additional period of performance, or entitlement of compensation except as set forth within the contract. In the event the Contractor's personnel work during the holiday, they may be reimbursed by the Contractor, however, no form of holiday or other premium compensation will be reimbursed either as a direct or indirect cost, other than their normal compensation for the time worked. This provision does not preclude reimbursement for authorized overtime work if applicable to this contract.

(f) When the Federal, State, Local or other Governmental entity grants excused absence to its employees, assigned Contractor personnel may also be dismissed. The Contractor agrees to continue to provide sufficient personnel to perform critical tasks already in operation or scheduled, and must be guided by the instructions issued by the CO or COR.

(g) If Government personnel are unavailable due to furlough or any other reason, the Contractor must contact the CO or the COR to receive direction. It is the Government's decision as to whether the contract price/cost will be affected. Generally, the following situations apply:

(1) Contractor personnel who are able to continue contract performance (either on-site or at a site other than their normal workstation), must continue to work and the contract price shall not be reduced or increased.

(2) Contractor personnel who are not able to continue contract performance (e.g., support functions) may be asked to cease their work effort. This may result in a reduction to the contract price.

PSA203-70 Subpoenas (SEP 2013)

For the purposes of this contract, a subpoena is a command to appear that may or may not be signed by a judge, to give sworn testimony and/or to produce documents at a certain time and place.

Any contractor or subcontractor at any tier (to include its officers, employees, or agents) in receipt of a subpoena requesting information related to the services provided under this contract, or which relates to PSA operations, must notify the Contracting Officer and Contracting Officer's Representative. Notification should be provided, in writing, as soon as possible, but not later than one (1) business day after receipt of the subpoena to allow PSA time to review and take any action required by law to protect Government information. Written notification shall include a copy of the subpoena.

All requests for the testimony by the Contractor or its employees, and any intention to testify as an expert witness relating to: (a) any work required by, and/or performed under, this contract; or (b) any information provided by any party to assist the Contractor in the performance of this contract, must be immediately reported to the Contracting Officer and Contracting Officer's Representative. Neither the Contractor nor its employees may testify on a matter related to work performed or information provided under this contract, either voluntarily or pursuant to a request, in any judicial or administrative proceeding unless approved by the Contracting Officer or required by a judge via a court order.

The Contracting Officer shall provide additional guidance as needed and may request additional information. Contractor staff shall cooperate with the Contracting Officer and Contracting Officer's Representative and shall provide requested information, and as appropriate, testimony, in a timely manner.

This clause shall flow down and be included in all subcontracts (all tiers) issued in support of this contract.

PSA204-70 Announcement of Contract Award (SEP 2013)

PSA complies with FAR 5.3, Synopses of Contract Awards, in terms of synopsisizing and publicly announcing contract awards. These actions take place at the time of, and not before, the contract is awarded. Contract award, in this case, means signature of the contractual document by the Contracting Officer and forwarding of the contractual document to the contract awardee. If the contract awardee wishes to make a separate public announcement, the awardee must obtain the approval of the Contracting Officer prior to releasing the announcement, and must plan to make announcement only after the contract has been awarded.

PSA204-71 Contractor Personnel Security Requirements (FEB 2016)

All Contractor and Sub-contractor employees requiring routine physical access to a Federally-controlled facility and/or access to a Federally-controlled information system in performance of this Contract shall be subject to this Clause (PSA204-71) as well as FAR 52.204-9 and must undergo a *Preliminary Background Check* and *Personnel Security Screening* prior to being allowed onsite. The background check will be performed by either PSA or the Office of Personnel Management (OPM) at no cost to the contractor. Contractor and sub-contractor employees subject to this Clause shall not be granted routine physical access to PSA/CSOSA- controlled facilities or access to PSA/CSOSA-controlled information systems prior to receiving favorable results from the *Preliminary Background Check* and *Personnel Security Screening*.

(b) Upon contract award, the Contracting Officer (CO) shall provide the Contractor with a *Security Form for PSA Contractors, Agency Credit Release*, and *Optional Form 306*. The Contractor shall notify the Contracting Officer immediately if they do not receive a copy of each of these forms along with a copy of the fully executed contract.

(c) Within five (5) calendar days of the effective date of the Contract the Contractor shall submit a roster, by name, position and responsibility, of all staff (including subcontractor staff at all tiers) subject to this Clause. The Contractor shall include, as an attachment to the roster, a completed *Security Form for PSA Contractors, Agency Credit Release, and Optional Form 306* for each individual listed on the roster. The roster and completed security forms shall be submitted to the Contracting Officer (CO) with copy to the Contracting Officer's Representative (COR).

(d) All Contractor and Sub-contractor employees subject to this Clause must pass a comprehensive security background check before starting work on the project. Upon receipt of the roster and completed security forms, the CO or Contracting Officer Representative (COR) shall coordinate with the PSA Personnel Security Officer to schedule fingerprinting of each contractor applicant. The Contractor shall allow for up to ten (10) business days from the date the PSA receives copies of the completed security forms and fingerprints for completion of the *Preliminary Background Check and Personnel Security*

Screening. Applicants shall bring two (2) forms of identification for fingerprinting, one of which must be issued by a State or Government agency. PSA shall not be responsible for any schedule delays due to untimely submission of the required security forms and/or applicant fingerprinting, nor shall PSA be responsible for any schedule delays due to proposed personnel receiving unfavorable background checks. Refer to PSA Specific Clause PSA200-70 for further information on what is considered a "business day."

PSA209-70 Contractor Performance Capabilities (SEP 2013)

The Contractor must be capable of performing all the tasks described in the Statement of Work. The Government shall not be liable for any costs or other involvement in the purchase, repair, maintenance or replacement of Contractor items used to implement or comply with requirements of the contract. Likewise, the Government shall in no way be held accountable by the Contractor for the Contractor's inability to perform under this Contract due to Government technology implementations and/or changes.

PSA209-71 Contractor's Key Personnel (SEP 2013)

(a) In order to ensure a smooth and orderly startup of work, it is essential that the key personnel specified in the Contractor's proposal be available on the effective date of the contract. If these personnel are not made available at that time, the Contractor must notify the Government Contracting Officer and show cause. If the Contractor does not show cause, the Contractor may be subject to default action.

(b) The Contractor shall not of its own remove or replace any personnel designated as "key" personnel without the written concurrence of the cognizant Contracting Officer. Prior to utilizing employees other than specified personnel, the Contractor shall notify the Government Contracting Officer and the COR. This notification must be no later than five (5) calendar days in advance of any proposed substitution and must include justification (including resume(s) of proposed substitution(s)) in sufficient detail to permit evaluation of the impact on contract performance.

(c) Substitute personnel qualifications must be equal to, or greater than, those of the personnel being substituted. If the Government Contracting Officer and the COR determine that the proposed substitute personnel is unacceptable, or that the reduction of effort would be so substantial as to impair the successful performance of the work under the contract, the Contractor may be subject to default action. If deemed necessary by the Government, substitute personnel must be given a one-(1) day orientation by Contractor personnel at no additional cost to the Government and with no change in the delivery schedule.

(d) In the event that the performance of assigned Contractor personnel or any substitute(s) is determined by the Government to be unsatisfactory at any time during the life of the Contract, the Government reserves the right to request and receive satisfactory personnel replacement within five (5) calendar days of receipt by the Contractor of written notification. Notification will include the reason for requesting replacement personnel.

(e) The Contractor-supplied personnel are employees of the Contractor and under the administrative control and supervision of the Contractor. The Contractor, through its personnel, shall perform the tasks prescribed herein. The Contractor must select, supervise, and exercise control and direction over its employees (including subcontractors) under this Contract. The Government shall not exercise any supervision or control over the Contractor in its performance of contractual services under this contract. The Contractor is accountable to the Government for the action of its personnel.

(f) The Contractor is herewith notified that employee recruiting and employee retention practices shall be monitored on a regular basis.

(g) Every sixty days, the contractor shall submit a Contractor Staffing Change Report (included in the attachments) to the Contracting Officer and Contracting Officer's Representative summarizing staffing changes that have occurred within the previous reporting period. If no changes have occurred, state "no change" on the form.

PSA209-72 Qualifications of Contractor's Employees (SEP 2013)

The Contracting Officer may require dismissal from work of those employees which he/she deems incompetent, careless, insubordinate, unsuitable or otherwise objectionable, or whose continued employment he/she deems contrary to the public

interest or inconsistent with the best interest of national security. The Contractor must fill out, and cause each of its employees on the contract work to fill out, for submission to the Government, such forms as may be necessary for security or other reasons. Upon request of the Contracting Officer, the Contractor's employees must be fingerprinted. Each employee of the Contractor who works on this contract shall be a citizen of the United States of America, or an alien who has been lawfully admitted for permanent residence as evidenced by Alien Registration Receipt Card Form I-151, or who presents other evidence from the Immigration and Naturalization Service that employment will not affect his/her immigration status.

PSA209-73 Standards of Conduct (SEP 2013)

(a) Personnel assigned by the contractor to the performance of work under this order must be acceptable to the Government in terms of personal and professional conduct. Contractor personnel shall conform to standards of conduct as follows:

(1) No contractor employees shall solicit new business while performing work under this order.

(2) The contractor and its employees shall not discuss with unauthorized persons any information obtained in the performance of work under this order.

(b) Should the continued assignment to work under this order of any person in the contractor's organization be deemed by the Contracting Officer to conflict with the interests of the Government, that person shall be removed immediately from assignment, and the reason for removal shall be fully documented in writing by the Contracting Officer. Employment and staffing difficulties shall not be justification for failure to meet established schedules, and if such difficulties impair performance, the contractor may be subject to default.

PSA209-74 Organizational Conflicts of Interest (SEP 2013)

(a) The Contractor warrants that, to the best of the Contractor's knowledge and belief, there are no relevant facts or circumstances which could give rise to an organizational conflict of interest (OCI), as defined in FAR 9.5, Organizational and Consultants Conflicts of Interest, or that the Contractor has disclosed all such relevant information.

(b) The Contractor agrees that if an actual or potential OCI is discovered after award, the Contractor shall make a full disclosure in writing to the Contracting Officer. This disclosure must include a description of actions, which the Contractor has taken or proposes to take, after consultation with the Contracting Officer, to avoid, mitigate, or neutralize the actual or potential conflict.

(c) The Contracting Officer may terminate this contract for convenience, in whole or in part, if it deems such termination necessary to avoid an OCI. If the Contractor was aware of a potential OCI prior to award or discovered an actual or potential conflict after award and did not disclose or misrepresented relevant information to the Contracting Office, the Government may terminate the contract for default/Cause, debar the Contractor from Government contracting, or pursue such other remedies as may be permitted by law or this contract.

(d) The Contractor must include this clause in all subcontracts and in lower tier subcontracts unless a waiver is requested from, and granted by, the Contracting Officer.

(e) In the event that a requirement changes in such a way as to create a potential conflict of interest for the Contractor, the Contractor must:

(1) Notify the Contracting Officer of a potential conflict, and;

(2) Recommend to the Government an alternate approach which would avoid the potential conflict, or

(3) Present for approval a conflict of interest mitigation plan that will:

(i) Describe in detail the changed requirement that creates the potential conflict of interest; and

(ii) Outline in detail the actions to be taken by the Contractor or the Government in the performance of the task to mitigate the conflict, division of subcontractor effort, and limited access to information, or other acceptable means.

(4) The Contractor must not commence work on a changed requirement related to a potential conflict of interest until specifically notified by the Contracting Officer to proceed.

(5) If the Contracting Officer determines that it is in the best interest of the Government to proceed with work, notwithstanding a conflict of interest, a request for waiver must be submitted in accordance with FAR 9.503.

PSA224-71 Freedom of Information Act Requests (SEP 2013)

(a) Offerors are reminded that information furnished under this solicitation may be subject to disclosure under the Freedom of Information Act (FOIA). Therefore:

(1) All items that are confidential to business, or contain trade secrets, proprietary, or personnel information must be clearly marked in all documents submitted to the Pretrial Services Agency for the District of Columbia (PSA or The Government). Marking of items will not necessarily preclude disclosure when the PSA determines disclosure is warranted by FOIA. However, if such items are not marked, all information contained within the submitted documents will be deemed to be releasable.

(2) No later than five (5) business days after award of a contract or order, the Contractor must provide the PSA Contracting Officer a redacted copy of the contract or order in electronic format. This copy will be used to satisfy any requests for copies of the contract or order under the FOIA. If the Contracting Officer believes that any redacted information does not require protection from public release, the issue will be resolved in accordance with paragraph 3.104-4(d) of the Federal Acquisition Regulation.

(b) Any information made available to the Contractor by the Government must be used only for the purpose of carrying out the provisions of this contract and must not be divulged or made known in any manner to any person except as may be necessary in the performance of the contract.

(c) In performance of this contract, the Contractor assumes responsibility for protection of the confidentiality of Government records and must ensure that all work performed by its subcontractors shall be under the supervision of the Contractor or the Contractor's responsible employees.

(d) Each officer or employee of the Contractor or any of its subcontractors to whom any Government record may be made available or disclosed must be notified in writing by the Contractor that information disclosed to such officer or employee can be used only for a purpose and to the extent authorized herein, and that further disclosure of any such information, by any means, for a purpose or to an extent unauthorized herein, may subject the offender to criminal sanctions imposed by 19 U.S.C. 641. That section provides, in pertinent part, that whoever knowingly converts to their use or the use of another, or without authority, sells, conveys, or disposes of any record of the United States or whoever receives the same with intent to convert it to their use or gain, knowing it to have been converted, shall be guilty of a crime punishable by a fine of up to \$10,000, or imprisoned up to ten years, or both.

PSA224-72 Records Management (JUN 2017)

PSA224-72 Records Management (JUN 2017)

A. Applicability

This clause applies to all Contractors whose employees create, work with, or otherwise handle Federal records, as defined in Section B, regardless of the medium in which the record exists.

B. Definitions

"Federal record" as defined in 44 U.S.C. § 3301, includes all recorded information, regardless of form or characteristics, made or received by a Federal agency under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the United States Government or because of the informational value of data in them.

The term Federal record:

1. includes Pretrial Services Agency for the District of Columbia (PSA) records.

2. does not include personal materials.
3. applies to records created, received, or maintained by Contractors pursuant to their PSA contract.
4. may include deliverables and documentation associated with deliverables.

C. Requirements

1. Contractor shall comply with all applicable records management laws and regulations, as well as National Archives and Records Administration (NARA) records policies, including but not limited to the Federal Records Act (44 U.S.C. chs. 21, 29, 31, 33), NARA regulations at 36 CFR Chapter XII Subchapter B, and those policies associated with the safeguarding of records covered by the Privacy Act of 1974 (5 U.S.C. 552a). These policies include the preservation of all records, regardless of form or characteristics, mode of transmission, or state of completion.
2. In accordance with 36 CFR 1222.32, all data created for Government use and delivered to, or falling under the legal control of, the Government are Federal records subject to the provisions of 44 U.S.C. chapters 21, 29, 31, and 33, the Freedom of Information Act (FOIA) (5 U.S.C. 552), as amended, and the Privacy Act of 1974 (5 U.S.C. 552a), as amended and must be managed and scheduled for disposition only as permitted by statute or regulation.
3. In accordance with 36 CFR 1222.32, Contractor shall maintain all records created for Government use or created in the course of performing the contract and/or delivered to, or under the legal control of the Government and must be managed in accordance with Federal law. Electronic records and associated metadata must be accompanied by sufficient technical documentation to permit understanding and use of the records and data.
4. PSA and its contractors are responsible for preventing the alienation or unauthorized destruction of records, including all forms of mutilation. Records may not be removed from the legal custody of PSA or destroyed except for in accordance with the provisions of the agency records schedules and with the written concurrence of the Head of the Contracting Activity. Willful and unlawful destruction, damage or alienation of Federal records is subject to the fines and penalties imposed by 18 U.S.C. 2701. In the event of any unlawful or accidental removal, defacing, alteration, or destruction of records, Contractor must report to PSA. The agency must report promptly to NARA in accordance with 36 CFR 1230.
5. The Contractor shall immediately notify the appropriate Contracting Officer upon discovery of any inadvertent or unauthorized disclosures of information, data, documentary materials, records or equipment. Disclosure of non-public information is limited to authorized personnel with a need-to-know as described in the contract. The Contractor shall ensure that the appropriate personnel, administrative, technical, and physical safeguards are established to ensure the security and confidentiality of this information, data, documentary material, records and/or equipment is properly protected. The Contractor shall not remove material from Government facilities or systems, or facilities or systems operated or maintained on the Government's behalf, without the express written permission of the Head of the Contracting Activity. When information, data, documentary material, records and/or equipment is no longer required, it shall be returned to PSA control or the Contractor must hold it until otherwise directed. Items returned to the Government shall be hand carried, mailed, emailed, or securely electronically transmitted to the Contracting Officer or address prescribed in the contract. Destruction of records is EXPRESSLY PROHIBITED unless in accordance with Paragraph (4).
6. The Contractor is required to obtain the Contracting Officer's approval prior to engaging in any contractual relationship (sub-contractor) in support of this contract requiring the disclosure of information, documentary material and/or records generated under, or relating to, contracts. The Contractor (and any sub-contractor) is required to abide by Government and PSA guidance for protecting sensitive, proprietary information, classified, and controlled unclassified information.
7. The Contractor shall only use Government IT equipment for purposes specifically tied to or authorized by the contract and in accordance with PSA policy.
8. The Contractor shall not create or maintain any records containing any non-public PSA information that are not specifically tied to or authorized by the contract.
9. The Contractor shall not retain, use, sell, or disseminate copies of any deliverable that contains information covered

by the Privacy Act of 1974 or that which is generally protected from public disclosure by an exemption to the Freedom of Information Act.

10. The PSA owns the rights to all data and records produced as part of this contract. All deliverables under the contract are the property of the U.S. Government for which PSA shall have unlimited rights to use, dispose of, or disclose such data contained therein as it determines to be in the public interest. Any Contractor rights in the data or deliverables must be identified as required by FAR 52.227-11 through FAR 52.227-20.
11. Training. All Contractor employees assigned to this contract who create, work with, or otherwise handle records are required to take PSA-provided records management training. The Contractor is responsible for confirming training has been completed according to agency policies, including initial training and any annual or refresher training.

D. Flowdown of requirements to subcontractors

1. The Contractor shall incorporate the substance of this clause, its terms and requirements including this paragraph, in all subcontracts under this contract, and require written subcontractor acknowledgment of same.
2. Violation by a subcontractor of any provision set forth in this clause will be attributed to the Contractor.

PSA228-70 Insurance (SEP 2013)

(a) In accordance with FAR 52.228-5, "Insurance-Work on a Government Installation (JAN 1997)" incorporated by reference, the Contractor must secure, pay the premiums for and keep in force until the expiration of this contract, and any renewal thereof, adequate insurance of the types and in the amounts as specified under FAR 28.3.

(b) Each policy of insurance must contain an endorsement that any cancellation or material change in the coverage adversely affecting the Government's interest must not be effective unless the insurer or the Contractor gives written notice of cancellation or change, as required by the CO. When the coverage is provided by self-insurance, the Contractor shall not change or decrease the coverage without the CO's prior approval.

(c) A certificate of each policy of insurance must be furnished to the CO within ten (10) days after notice of award certifying, among other things, that the policy contains the aforementioned endorsement. The insurance company providing the above insurance must be satisfactory to the Government. Notices of policy changes shall be furnished to the CO. The substance of this clause must be made to flow down to any subcontractors.

PSA233-70 PSA Protest Procedures (SEP 2013)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation may be filed directly with the agency or the Government Accountability Office (GAO). Protests that are filed directly with an agency, and copies of any protests that are filed with GAO, shall be served on the Contracting Officer by obtaining written and dated acknowledgement of receipt from the Contracting Officer.

(b) An interested party who files a protest with the agency has the option of requesting review and consideration of the protest by either the Contracting Officer (CO) or the Head of Contracting Activity (HCA) for the Pretrial Services Agency for the District of Columbia (PSA). The protest must clearly indicate the official to whom it is directed.

(c) If the protest is directed to the HCA, a copy must be sent to the Contracting Officer at the same time the protest is filed with the HCA. The address of the HCA is:

Jeffery C. Brakebill, C.P.M.
Head of Contracting Activity
Pretrial Services Agency for the District of Columbia
633 Indiana Avenue, NW, Suite 1158
Washington, DC 20004-2908

PSA237-70 Non-Personal Services (SEP 2013)

(a) As stated in the Office of Federal Procurement Policy Letter 92-1, dated September 23, 1992, Inherently Governmental Functions, no personal services shall be performed under this contract. No Contractor employee will be directly supervised by the Government. All individual employee assignments, and daily work direction, shall be given by the applicable employee supervisor. If the Contractor believes any Government action or communication has been given that would create a personal services relationship between the Government and any Contractor employee, the Contractor must promptly notify the Contracting Officer of this communication or action.

(b) The Contractor must not perform any inherently Governmental actions under this contract. No Contractor employee shall hold him or herself out to be a Government employee, agent, or representative. No Contractor employee may state orally or in writing at any time that he or she is acting on behalf of the Government. In all communications with third parties in connection with the contract, Contractor employees must identify themselves as Contractor employees and specify the name of the company for which they work. In all communications with other Government Contractors in connection with this contract, the Contractor employee must state that they have no authority to in any way change the contract and that if the other Contractor believes this communication to be a direction to change their contract, they should notify the Contracting Officer for that contract and not carry out the direction until a clarification has been issued by the Contracting Officer.

(c) The Contractor must insure that all of its employees working on this contract are informed of the substance of this clause. Nothing in this clause limits the Government's rights in any way under any other provision of the contract, including those related to the Government's right to inspect and accept the services to be performed under this contract. The substance of this clause must be included in all subcontracts at any tier.

PSA239-70 Information Security (MAR 2016)

All electronic data containing personally identifiable information (PII) regarding PSA staff, defendants and/or clients, must reside within the boundaries of the PSA/CSOSA data center. Vendors are prohibited from creating, processing, and/or storing electronic data and information containing personally identifiable information (PII) regarding PSA staff, defendants and/or clients on other than government-owned and furnished computing equipment. To clarify, vendors may not create, process, or store electronic data and information containing personally identifiable information (PII) regarding PSA staff, defendants and/or clients on the company computer systems, servers, laptops, mobile devices, smartphones, USB drives, or any online or cloud storage or file back-up system (including but not limited to Dropbox, Google Docs, iCloud, SkyDrive, Mozy, etc.). As appropriate, vendors will obtain PSA network and computer systems user accounts, including capabilities for secure remote access where appropriate, and be subject to all agency policies and operational instructions regarding information security and privacy. In the case of secure remote access, the vendor would access the secure PSA/CSOSA network via their company or personal computers; however all electronic data and information creation, processing, and storage must occur only on PSA/CSOSA servers and information systems via the secure remote connection. Any exceptions must be formally approved in writing by the PSA Chief Information Officer (CIO), the Records Management Officer, and formally distributed to the vendor in writing via the authorized PSA Contracting Officer. If exceptions are granted, specific information security and privacy requirements will be determined and formally provided to the vendor, via a formal modification to the contract, at time of approval. Such requirements will include at minimum, compliance with the Federal Information Security Management Act, privacy Act of 1974, and other applicable laws, regulations, policies and requirements.

The term "personally identifiable information" refers to information which can be used to distinguish or trace an individual's identity, such as their name, social security number, biometric records, etc. alone, or when combined with other personal or identifying information which is linked or linkable to a specific individual, such as date and place of birth, mother's maiden name, etc.

Data Security: Loss and/or Disclosure of Personally Identifiable Information (PII) - Notification of Data Breach

By acceptance of, or performance on, this contract, the contractor agrees that in the event of any actual or suspected breach of such data (i.e., loss of control, compromise, unauthorized disclosure, access for an unauthorized purpose, or other unauthorized access, whether physical or electronic), the contractor will immediately (and in no event later than within

one hour of discovery) report the breach to PSA's Chief information Officer and the Contracting Officer's Technical Representative (COR) or Contracting Officer (CO). Points of Contact shall be provided at time of award.

PSA242-70 Contract Performance Information (SEP 2013)

The Contractor must not publish, permit to be published, or distribute for public consumption, any information, oral or written, concerning the results or conclusions made pursuant to the performance of this contract, without the prior written consent of the Contracting Officer. Two copies of any material proposed to be published or distributed must be submitted to the Contracting Officer for approval.

PSA212-70 Invoice Requirements (DEC 2016)

- (a) All invoices must be submitted electronically to PSA-Invoices-Accounting@psa.gov and must contain, at a minimum, the information required by FAR Subpart 52.212-4(g). Invoices not received at the email address above and/or not containing the minimum information required at FAR 52.212-4(g) may be subject to return by the Agency and may result in delay of payment.
- (b) Invoices shall be submitted in a timely manner, but not later than 30 calendar days after delivery of goods or performance of service.
- (c) Contractor's final invoice shall be clearly marked as the FINAL INVOICE.
- (d) For contract awards exceeding \$150,000, within 30 calendar days following receipt of payment of FINAL INVOICE, the contractor shall submit, to the Contracting Officer, a completed Contractor's Release Statement which is included as an attachment to the contract.

Section J - List of Documents, Exhibits, and other Attachments

None

Clauses incorporated by reference

None

Clauses incorporated by full text

None

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE

PAGE OF PAGES

1 2

2. AMENDMENT/MODIFICATION NO.

PSA17C0043P00001

3. EFFECTIVE DATE

09/05/2018

4. REQUISITION/PURCHASE REQ. NO.

See Schedule

5. PROJECT NO. (If applicable)

6. ISSUED BY

CODE

959P00

7. ADMINISTERED BY (If other than Item 6)

CODE

959P00

PSA Pretrial Services Agency
633 Indiana Ave, NW, Suite 1134
Washington, DC, 20004, US

PSA Pretrial Services Agency
633 Indiana Ave, NW, Suite 1134
Washington, DC, 20004, US

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

MAXARTH, LLC
12215 FELLOWSHIP LN
NORTH POTOMAC, MD, 208783402, US

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

PSA17C0043

10B. DATED (SEE ITEM 13)

CODE LOC829885289

FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers

☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

See Schedule

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: NO. IN ITEM 10A.	(Specify authority)	THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER
<input type="checkbox"/>			
<input type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).		
<input checked="" type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR 52.212-4 (c) - Changes		
<input type="checkbox"/>	D. OTHER (Specify type of modification and authority)		

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return ¹ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

MODIFICATION CONTROL NUMBER: PSA17C0043P00001

SUMMARY OF CHANGES: Provide assistance and technical support to implement changes as further described in the schedule below.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) Avinash Bhati, PhD President Maxarth LLC	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Brakebill, Jeffery C Contracting Officer
15B. CONTRACTOR/OFFEROR // Signed / Avinash Bhati, PhD (Signature of person authorized to sign)	15C. DATE SIGNED 09/06/2018
16B. UNITED STATES OF AMERICA // Signed / Brakebill, Jeffery C (Signature of Contracting Officer)	16C. DATE SIGNED 09/07/2018

NSN 7540-01-152-8070
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA FAR (48 CFR) 53.243

Summary of Changes

Modification Changes

The purpose of this modification is to incorporate the following changes to contract PSA17C0043:

1. Technical support services for implementation of enhancements to PSA's client management system, as further described in the attached Scope of Work and Contractor's revised proposal dated September 4, 2018, are hereby incorporated.
2. In consideration for the additional services, the total fixed price amount of this contract is hereby increased by \$110,189.93 and the period of performance is extended through March 6, 2019.
3. The Contracting Officer's Representative is changed to Michael Kainu, who can be reached at (202) 442-1091 or Michael.Kainu@psa.gov. A copy of Mr. Kainu's COR Appointment Letter is attached.

Header Level Changes:

The Total Amount is increased by \$110,189.93 from \$254,858.40 to \$365,048.33.

The attachment with file name MaxarthLLC_PSA17C0043_AddOnProposal_Rev20180904.pdf and title MS09: Revised Proposal was added.

The attachment with file name Additional Services for Risk Assessment.pdf and title MP01: Scope of Work for Modification was added.

The attachment with file name C09 - COR Appointment Letter.pdf and title C09: COR Appointment Letter was added.

Line Level Changes:

Newly Added Line:

Line Number: 0002

Item Description: Provide technical support for implementation of risk assessment tool enhancements per the attached Scope of Work and Contractor's revised proposal dated September 4, 2018.

Unit Of Measure: Misc

Line Type: AMOUNT

Unit Price: \$1.00

Contract Type: Firm Fixed Price

Unit Price: \$110,189.93

Ship Number: 1

Distribution 2:

Distribution Line Number: 0002

Charge Account: 2018|1734A1818D|RACSRV000000|1401010500|NA|251100|999996|9999|NA|NA|NA|NA

Funded Value: \$5,189.93

Distribution 1:

Distribution Line Number: 0002

Charge Account: 2018|1734A1818D|RACSRV000000|1401010500|NA|251100|999996|9999|NA|NA|NA|NA

Funded Value: \$105,000.00

Scope:

PSA uses a scientifically-validated risk assessment tool to support judicial decisions regarding defendant pretrial release or detention. To ensure continued accuracy and validity of the tool, PSA periodically re-validates its risk assessment tool. In FY2018, PSA completed the revalidation of its risk assessment tool. This re-validation resulted in significant enhancements to the risk assessment tool that require recalibration of the tool in PSA's client management system. These enhancements include addition of new predictive factors, elimination of others, and recalculation of risk scores. Given the high reliance of judicial officers on PSA's risk assessment tool for their decision-making, and the technical complexity of implementing these enhancements into the Agency's client management system, PSA is seeking assistance to provide technical support for this implementation.

Task	Deliverable	Deliverable Due
1. Analyze impact of initial court release condition(s) on defendant's risk of pretrial misconduct.	Analysis report and in-person briefing	1-month from date of contract modification
2. Analyze the simulated impact of revised Risk-Based Supervision protocols.	Analysis report and in-person briefing	4-months from date of contract modification
3. Analyze the impact of revised risk assessment tool in comparison to current risk assessment tool to gauge changes on caseload distribution and corresponding risk of pretrial misconduct.	Analysis report and in-person briefing	5-months from date of contract modification
4. Provide support for implementation of the re-validated risk assessment to include updated weighting and certifying proper implementation into PSA's client management system.	Provide report certifying re-validated risk assessment model is scoring each defendant as intended in PSA's client management system.	6-months from date of contract modification

August 31, 2018

Jeffery C. Brakebill, C.P.M.
Contracting Officer
Pretrial Services Agency for the District of Columbia
633 Indiana Avenue, NW, Suite 1120
Washington, DC 20004

**RE: MODIFICATION TO RISK ASSESSMENT REVALIDATION
 CONTRACT (PSA17C0043)**

Dear Mr. Brakebill:

Maxarth LLC is pleased to submit a response to PSA's request for additional technical assistance in implementing the revised risk assessment tool. We have reviewed the proposed SOW and agree to the task list and rough timelines. Because some of the tasks require more labor input than others, this document lists out a proposed payment schedule that is consistent with the effort. Because the contract is fixed price, I have taken the liberty of developing proposed deliverables that these payments can be tied to.




Maxarth LLC estimates that the technical assistance will require approximately [REDACTED] hours of Dr. Bhati's time over the proposed six-month period starting Sep 2018. Dr. Bhati's un-loaded hourly rate is [REDACTED]. This is a 5% increase from the rate Maxarth LLC charged the government last year. The Overhead/G&A and Profit rates are the same as the original contract. The table below provides computations of the total resulting budget of \$119,585.97.

Direct Labor			
<i>Labor Category</i>	<i>Hours</i>	<i>Rate</i>	<i>Total</i>
Principal Investigator (Dr. Bhati)	[REDACTED]	[REDACTED]	[REDACTED]
Total Direct Labor =		[REDACTED]	[REDACTED]
Overhead and G&A			
<i>Base description</i>	<i>Base Amount</i>	<i>Rate</i>	<i>Total</i>
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Profit & Fee			
<i>Base description</i>	<i>Base Amount</i>	<i>Rate</i>	<i>Total</i>
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Project Total			[REDACTED]

The tasks list proposed by PSA are further detailed below to clarify our understanding of the various sub-tasks involved as well as the estimated hours of labor involved. Labor hours are inclusive of time for developing and presenting reports/findings.

1. **Task 1** [REDACTED] Analyze impact of initial court release conditions on defendant's risk of pretrial misconduct. This task will include an assessment of the impacts of

initial court release conditions on the eventual probability of FTA or re-arrest as well as the immediate impacts of these conditions on the misconduct if it occurs prior to any infractions. Infractions present an opportunity to PSA to intervene with a client but if clients have misconduct without any infractions, the agency's leverage with a client is reduced. Therefore imposing appropriate mix of release conditions may be a way of reducing misconduct. Under Task 1 Dr. Bhati will analyze this issue.

2. **Task 2**  Analysis the simulated impact of revised Risk-Based Supervision protocols: This task will entail a series of analysis that can provide PSA more guidance on how best to respond to defendant conduct while under pretrial supervision. This includes:
 - a. Subtask 2.a: An analysis of the impacts of different responses on different outcomes (to clarify if, at all, there are responses that may have conflicting impacts on FTA, re-arrest, case disposition, or the number of infractions.
 - b. Subtask 2.b: An analysis of the simulated impacts of offering a menu of response options to supervision officers so they may customizer their response to individual clients.
3. **Task 3**  Analysis of the impacts of the revised risk assessment tool, compared with the current tool, on agency caseload and/or misconduct rates. Comparing the existing and revised risk assessment tool can be done using two distinct criteria. These include:
 - a. Subtask 3.a: An assessment of the impacts on caseloads by following the resource constraint model (i.e., where classification cut-points are designed to mimic, as close as possible, the classification distributions of the old classification system). Under this model, the overall misconduct rate can be different and the hope is that the revised model produces more favorable misconduct rates.
 - b. Subtask 3.b: An assessment of the impacts on caseloads by following the outcome constraint model (i.e., where the classification cut-points are designed to create groups with similar misconduct rates to the current system). Under this model, the overall caseloads might be altered and an analysis can determine whether there is an optimal tradeoff between focusing on the two criteria.
4. **Task 4**  Provide support for implementation of the revised risk assessment tool to include updated weights and variable definitions/computations. This task entails numerous meeting with PSA IT staff to ensure an accurate implementation of the revised tool:
 - a. Subtask 4.a: Obtain a new dataset from PSA that Maxarth will score independently of PSA scoring.
 - b. Subtask 4.b: As needed, review SQL scripts from PSA to ensure variables are defined and translated correctly as well as to ensure cut-points are implemented accurately. This task will provide technical assistance to PSA to ensure the various risk scores are combined in an appropriate manner.

Based on the above task description and effort level, the following table presents a proposed payment schedule with deliverable list. The payment schedule in the table assumes that the contract add-on begins on Sep 7, 2018.

Payment #	Invoice Date	Amount	Tasks completed
1	30-Sep-18		Task 1 Analysis Report and In-Person Briefing
2	31-Oct-18		Task 2 Analysis Completed - Simulated Impacts on Multiple Outcomes
3	30-Nov-18		Task 2 Analysis Completed - Simulated Impacts of Menu of Response Options
4	31-Dec-18		Task 2 Analysis Report and In-Person Briefing
5	31-Jan-19		Task 3 Analysis Report and In-Person Briefing
6	28-Feb-19		Task 4 Report Certifying Re-validated Instrument is Implemented Correctly
			Total

Should you need additional information from Maxarth LLC or if we have misunderstood the government's technical assistance needs and/or the SOW, please do not hesitate to contact me. Maxarth LLC has enjoyed working with the Pretrial Services Agency for the District of Columbia over the last decade and looks forward to continuing this partnership. I look forward to hearing from you.

Thank you.

Sincerely,



Avinash Bhati, PhD
 President Maxarth LLC
abhati@maxarth.com
 (301) 873-1898

September 4, 2018

Jeffery C. Brakebill, C.P.M.
Contracting Officer
Pretrial Services Agency for the District of Columbia
633 Indiana Avenue, NW, Suite 1120
Washington, DC 20004

**RE: MODIFICATION TO RISK ASSESSMENT REVALIDATION
 CONTRACT (PSA17C0043) – REVISED PROPOSAL**

Dear Mr. Brakebill:

Maxarth LLC is pleased to submit a response to PSA's request for additional technical assistance in implementing the revised risk assessment tool. We have reviewed the proposed SOW and agree to the task list and rough timelines. Because some of the tasks require more labor input than others, this document lists out a proposed payment schedule that is consistent with the effort. Because the contract is fixed price, I have taken the liberty of developing proposed deliverables that these payments can be tied to.




Maxarth LLC estimates that the technical assistance will require approximately [REDACTED] hours of Dr. Bhati's time over the proposed six-month period starting Sep 2018. Dr. Bhati's un-loaded hourly rate is [REDACTED]. This is a 5% increase from the rate Maxarth LLC charged the government last year. The Overhead/G&A and Profit rates are the same as the original contract. The table below provides computations of the total resulting budget of \$110,189.93.

Direct Labor			
Labor Category	Hours	Rate	Total
Principal Investigator (Dr. Bhati)	[REDACTED]	[REDACTED]	[REDACTED]
		Direct Labor =	[REDACTED]
Overhead and G&A			
Base description	Base Amount	Rate	Total
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Profit & Fee			
Base description	Base Amount	Rate	Total
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]

The tasks list proposed by PSA are further detailed below to clarify our understanding of the various sub-tasks involved as well as the estimated hours of labor involved. Labor hours are inclusive of time for developing and presenting reports/findings.

1. **Task 1** [REDACTED] Analyze impact of initial court release conditions on defendant's risk of pretrial misconduct. This task will include an assessment of the impacts of initial court release conditions on the eventual probability of FTA or re-arrest as well

as the immediate impacts of these conditions on the misconduct if it occurs prior to any infractions. Infractions present an opportunity to PSA to intervene with a client but if clients have misconduct without any infractions, the agency's leverage with a client is reduced. Therefore imposing appropriate mix of release conditions may be a way of reducing misconduct. Under Task 1 Dr. Bhati will analyze this issue.

2. **Task 2**  Analysis the simulated impact of revised Risk-Based Supervision protocols: This task will entail a series of analysis that can provide PSA more guidance on how best to respond to defendant conduct while under pretrial supervision. This includes:
 - a. Subtask 2.a: An analysis of the impacts of different responses on different outcomes (to clarify if, at all, there are responses that may have conflicting impacts on FTA, re-arrest, case disposition, or the number of infractions.
 - b. Subtask 2.b: An analysis of the simulated impacts of offering a menu of response options to supervision officers so they may customizer their response to individual clients.
3. **Task 3**  Analysis of the impacts of the revised risk assessment tool, compared with the current tool, on agency caseload and/or misconduct rates. Comparing the existing and revised risk assessment tool can be done using two distinct criteria. These include:
 - a. Subtask 3.a: An assessment of the impacts on caseloads by following the resource constraint model (i.e., where classification cut-points are designed to mimic, as close as possible, the classification distributions of the old classification system). Under this model, the overall misconduct rate can be different and the hope is that the revised model produces more favorable misconduct rates.
 - b. Subtask 3.b: An assessment of the impacts on caseloads by following the outcome constraint model (i.e., where the classification cut-points are designed to create groups with similar misconduct rates to the current system). Under this model, the overall caseloads might be altered and an analysis can determine whether there is an optimal tradeoff between focusing on the two criteria.
4. **Task 4**  Provide support for implementation of the revised risk assessment tool to include updated weights and variable definitions/computations. This task entails numerous meeting with PSA IT staff to ensure an accurate implementation of the revised tool:
 - a. Subtask 4.a: Obtain a new dataset from PSA that Maxarth will score independently of PSA scoring.
 - b. Subtask 4.b: As needed, review SQL scripts from PSA to ensure variables are defined and translated correctly as well as to ensure cut-points are implemented accurately. This task will provide technical assistance to PSA to ensure the various risk scores are combined in an appropriate manner.

Based on the above task description and effort level, the following table presents a proposed payment schedule with deliverable list. The payment schedule in the table assumes that the contract add-on begins on Sep 7, 2018.

Payment #	Invoice Date	Amount	Tasks completed
1	30-Sep-18		Task 1 Analysis Report and In-Person Briefing
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3	30-Nov-18		Task 2 Analysis Completed - Simulated Impacts of Menu of Response Options
4	31-Dec-18		Task 2 Analysis Report and In-Person Briefing
5	31-Jan-19		Task 3 Analysis Report and In-Person Briefing
6	28-Feb-19		Task 4 Report Certifying Re-validated Instrument is Implemented Correctly
			Total

Should you need additional information from Maxarth LLC or if we have misunderstood the government's technical assistance needs and/or the SOW, please do not hesitate to contact me. Maxarth LLC has enjoyed working with the Pretrial Services Agency for the District of Columbia over the last decade and looks forward to continuing this partnership. I look forward to hearing from you.

Thank you.

Sincerely,



Avinash Bhati, PhD
President Maxarth LLC
abhathi@maxarth.com
(301) 873-1898

MEMORANDUM FOR RECORD
Modification 959P0017C0043P00001

This memorandum provides the documentation necessary to support modification P00001 to contract number 959P0017C0043, issued to Maxarth, LLC.

BACKGROUND

On September 7, 2017, PSA issued contract number PSA17C0043 as an SBA Section 8(a) Direct Award to Maxarth LLC for the purpose of conducting a Risk Assessment Revalidation Study. The performance period for this risk assessment was from September 7, 2017 through September 6, 2018. As a result of this study, significant enhancements to the risk assessment tool were identified which require recalibration of the tool in PSA's client management system. These enhancements include addition of new predictive factors, elimination of others, and recalculation of risk scores. Given the high reliance of judicial officers on PSAs risk assessment tool for their decision-making, and the technical complexity of implementing these enhancements, PSA determined additional assistance was required from the contractor for implementation. PSA IGE for these services is \$105,000. Funding in this amount was provided on requisition number PSA180303.

On August 31, 2018, Maxarth was approached to provide a price proposal for the additional services required to implement the changes. Maxarth provided response later the same day. In the initial proposal, Maxarth outlined their understanding of the work required as well as a fixed price proposal for completing the work. A copy of the contractor's proposal was forwarded to the program office for review and concurrence of the contractor's understanding and technical approach. The initial cost proposal came in at \$119,585.97. Pending technical review, the contracting officer requested a budget ceiling which could be used during price negotiations. A budget ceiling was set at \$112,000.

On September 4, 2018, the program office advised that the technical review was complete and that the contractor's understanding and approach were acceptable. The Contracting Officer then opened negotiations with the contractor. The target (objective) of approximately \$110,000. The final negotiated price for services was agreed at **\$110,189.93**.

PURPOSE OF MODIFICATION

The purpose of modification P00001 is to modify contract number PSA17C0043 to include the additional in-scope work. In consideration for the additional services, the contract performance period will be extended by 6 months and the amount of the contract will be increased by \$110,189.93.

AUTHORITY

FAR 52.212-4(c), Changes

PREPARED BY

Jeffery C.
Brakebill

Digitally signed by Jeffery C.
Brakebill
Date: 2018.09.05 07:40:15
-04'00'

September 5, 2018

Jeffery C. Brakebill
Contracting Officer



CREATIVE DATA AND ANALYTICAL SOLUTIONS

August 31, 2018

Jeffery C. Brakebill, C.P.M.
Contracting Officer
Pretrial Services Agency for the District of Columbia
633 Indiana Avenue, NW, Suite 1120
Washington, DC 20004

**RE: MODIFICATION TO RISK ASSESSMENT REVALIDATION
 CONTRACT (PSA17C0043)**

Dear Mr. Brakebill:

Maxarth LLC is pleased to submit a response to PSA's request for additional technical assistance in implementing the revised risk assessment tool. We have reviewed the proposed SOW and agree to the task list and rough timelines. Because some of the tasks require more labor input than others, this document lists out a proposed payment schedule that is consistent with the effort. Because the contract is fixed price, I have taken the liberty of developing proposed deliverables that these payments can be tied to.

Maxarth LLC estimates that the technical assistance will require approximately [REDACTED] hours of Dr. Bhati's time over the proposed six-month period starting Sep 2018. Dr. Bhati's un-loaded hourly rate is [REDACTED]. This is a 5% increase from the rate Maxarth LLC charged the government last year. The Overhead/G&A and Profit rates are the same as the original contract. The table below provides computations of the total resulting budget of \$119,585.97.

Direct Labor			
Labor Category	Hours	Rate	Total
Principal Investigator (Dr. Bhati)	[REDACTED]	[REDACTED]	[REDACTED]
Overhead and G&A			
Base description	Base Amount	Rate	Total
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Profit & Fee			
Base description	Base Amount	Rate	Total
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]			

The tasks list proposed by PSA are further detailed below to clarify our understanding of the various sub-tasks involved as well as the estimated hours of labor involved. Labor hours are inclusive of time for developing and presenting reports/findings.

1. **Task** [REDACTED] Analyze impact of initial court release conditions on defendant's risk of pretrial misconduct. This task will include an assessment of the impacts of

initial court release conditions on the eventual probability of FTA or re-arrest as well as the immediate impacts of these conditions on the misconduct if it occurs prior to any infractions. Infractions present an opportunity to PSA to intervene with a client but if clients have misconduct without any infractions, the agency's leverage with a client is reduced. Therefore imposing appropriate mix of release conditions may be a way of reducing misconduct. Under Task 1 Dr. Bhati will analyze this issue.

2. **Task 2** [REDACTED]: Analysis the simulated impact of revised Risk-Based Supervision protocols: This task will entail a series of analysis that can provide PSA more guidance on how best to respond to defendant conduct while under pretrial supervision. This includes:
 - a. Subtask 2.a: An analysis of the impacts of different responses on different outcomes (to clarify if, at all, there are responses that may have conflicting impacts on FTA, re-arrest, case disposition, or the number of infractions.
 - b. Subtask 2.b: An analysis of the simulated impacts of offering a menu of response options to supervision officers so they may customizer their response to individual clients.
3. **Task 3** [REDACTED]: Analysis of the impacts of the revised risk assessment tool, compared with the current tool, on agency caseload and/or misconduct rates. Comparing the existing and revised risk assessment tool can be done using two distinct criteria. These include:
 - a. Subtask 3.a: An assessment of the impacts on caseloads by following the resource constraint model (i.e., where classification cut-points are designed to mimic, as close as possible, the classification distributions of the old classification system). Under this model, the overall misconduct rate can be different and the hope is that the revised model produces more favorable misconduct rates.
 - b. Subtask 3.b: An assessment of the impacts on caseloads by following the outcome constraint model (i.e., where the classification cut-points are designed to create groups with similar misconduct rates to the current system). Under this model, the overall caseloads might be altered and an analysis can determine whether there is an optimal tradeoff between focusing on the two criteria.
4. **Task 4** [REDACTED]: Provide support for implementation of the revised risk assessment tool to include updated weights and variable definitions/computations. This task entails numerous meeting with PSA IT staff to ensure an accurate implementation of the revised tool:
 - a. Subtask 4.a: Obtain a new dataset from PSA that Maxarth will score independently of PSA scoring.
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CREATIVE DATA AND ANALYTICAL SOLUTIONS

Based on the above task description and effort level, the following table presents a proposed payment schedule with deliverable list. The payment schedule in the table assumes that the contract add-on begins on Sep 7, 2018.

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3	30-Nov-18		Task 2 Analysis Completed - Simulated Impacts of Menu of Response Options
4	31-Dec-18		Task 2 Analysis Report and In-Person Briefing
5	31-Jan-19		Task 3 Analysis Report and In-Person Briefing
6	28-Feb-19		Task 4 Report Certifying Re-validated Instrument is Implemented Correctly
			Total

Should you need additional information from Maxarth LLC or if we have misunderstood the government's technical assistance needs and/or the SOW, please do not hesitate to contact me. Maxarth LLC has enjoyed working with the Pretrial Services Agency for the District of Columbia over the last decade and looks forward to continuing this partnership. I look forward to hearing from you.

Thank you.

Sincerely,

Avinash Bhati, PhD
President Maxarth LLC
abhati@maxarth.com
(301) 873-1898

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE

PAGE OF PAGES

1 2

2. AMENDMENT/MODIFICATION NO.

PSA17C0043P00002

3. EFFECTIVE DATE

02/15/2019

4. REQUISITION/PURCHASE REQ. NO.

See Schedule

5. PROJECT NO. (If applicable)

6. ISSUED BY

CODE

959P00

7. ADMINISTERED BY (If other than Item 6)

CODE

959P00

PSA Pretrial Services Agency
633 Indiana Ave, NW, Suite 1134
Washington, DC, 20004, US

PSA Pretrial Services Agency
633 Indiana Ave, NW, Suite 1134
Washington, DC, 20004, US

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

MAXARTH, LLC
12215 FELLOWSHIP LN
NORTH POTOMAC, MD, 208783402, US

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

PSA17C0043

10B. DATED (SEE ITEM 13)

08/23/2017

CODE LOC829885289

FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

See Schedule

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

☐
☐
☒
☐

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
FAR 52.212-4 (c) - Changes

D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor ☒ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

MODIFICATION CONTROL NUMBER: PSA17C0043P00002

SUMMARY OF CHANGES: The purpose of this modification is to incorporate the following change to contract PSA17C0043

The Period of Performance is extended from March 6, 2019 to May 5, 2019.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)

16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)

DOBBS, RACHEL
Contracting Officer

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

// Signed / DOBBS, RACHEL

02/21/2019

(Signature of person authorized to sign)

(Signature of Contracting Officer)

Summary of Changes

Section B - Supplies or Services and Prices/Costs

Line Item Details:

Line Items Added:

Line Item 0003 is added as follows:

Item Number	Base Item Number	Supplies/Services	
0003		Risk Assessment Revalidation Contract Extension - PSA17C0043 to May 6, 2019	
Description:			
Purchase Requisitions			

IDC Type:

Not Applicable



PRETRIAL SERVICES AGENCY *for the DISTRICT of COLUMBIA*
OFFICE OF PLANNING, POLICY AND ANALYSIS

To: Jeffery Brakebill, Contracting Officer, Office of Finance and Administration
From: Michael Kainu, COR for contract PSA17C0043, Office of Planning, Policy and Analysis
Date: February 8, 2019
Re: Contract Extension- PSA17C0043

Please consider this request for a no cost 60-day extension for contract PSA17C0043 with Maxarth, LLC, currently due to expire on March 6, 2019.

One of the major deliverables of this contract is support from Maxarth, LLC in implementing the revised Risk Assessment Instrument (RAI) into PSA's case management system, PRISM. While this contract PSA17C0043 was not affected by the shutdown, the OIT resources and government oversight required for the implementation were not available during that time. As a result, this deliverable was put on hold. Further, the shutdown delayed other IT projects which in turn have delayed our access to OIT resources for this implementation.

Therefore, in order to complete tasks associated with this contract, we are requesting a no cost 60-day extension for PSA17C0043 until May 5, 2019. Thank you for your assistance in this matter, and please let us know of any additional information you need.

CC: Hala Maktabi, Director, Office of Planning Policy and Analysis
Rachel Dobbs, Contract Specialist, Office of Finance and Administration
Geraldine Decembre, Special Assistant, Office of the Director

SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS				1. REQUISITION NUMBER PSA170218		PAGE 1 OF 47	
OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30				5. SOLICITATION NUMBER PSA17Q0034		6. SOLICITATION ISSUE DATE 08/07/2017	
2. CONTRACT NO.		3. AWARD/EFFECTIVE DATE		4. ORDER NUMBER			
7. FOR SOLICITATION INFORMATION CALL:		a. NAME Weiss, Diana T			b. TELEPHONE NUMBER (No collect calls)		8. OFFER DUE DATE/ LOCAL TIME 2017-08-16T08:00:00.0
9. ISSUED BY PSA Pretrial Services Agency 633 Indiana Ave, NW, Suite 1134 Washington, DC, 20004, US		CODE	959P00	10. THIS ACQUISITION IS <input checked="" type="checkbox"/> UNRESTRICTED OR <input type="checkbox"/> SET ASIDE: 0 % FOR:			
				<input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> WOMEN-OWNED SMALL BUSINESS (WOSB) <input type="checkbox"/> HUBZONE SMALL BUSINESS <input type="checkbox"/> ECONOMICALLY DISADVANTAGED WOMEN-OWNED SMALL BUSINESS (EDWOSB) <input type="checkbox"/> SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS <input type="checkbox"/> 8 (A)		NAICS: SIZE STANDARD:	
11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input checked="" type="checkbox"/> SEE SCHEDULE		12. DISCOUNT TERMS		13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) <input type="checkbox"/>		13b. RATING	
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15. DELIVER TO See Schedule		CODE		16. ADMINISTERED BY		CODE	
17a. CONTRACTOR/OFFEROR Maxarth LLC 12215 Fellowship Lane, North Potomac, MD 20878 TELEPHONE NO. (301) 873-1898		CODE		18a. PAYMENT WILL BE MADE BY		CODE	
		FACILITY CODE					
<input type="checkbox"/> 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER		18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED <input type="checkbox"/> SEE ADDENDUM					
19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES			21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	See Schedule					\$ 254,858.40	\$ 254,858.40
				(Use Reverse and/or Attach Additional Sheets as Necessary)			
25. ACCOUNTING AND APPROPRIATION DATA See Schedule					26. TOTAL AWARD AMOUNT (For Govt. Use Only)		
<input type="checkbox"/> 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4, FAR 52.212-3 AND 52.212-5 ARE ATTACHED. ADDENDA					<input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED		
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<input checked="" type="checkbox"/> 28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED					<input type="checkbox"/> 29. AWARD OF CONTRACT: REF. _____ OFFER DATED _____ YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:		
30a. SIGNATURE OF OFFEROR/CONTRACTOR <div style="border: 1px solid black; padding: 5px; text-align: center;">(b)(6); (b)(7)(C)</div>				31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER)			
30b. NAME AND TITLE OF SIGNER (Type or print) Avinash Bhati, PhD President Maxarth LLC		30c. DATE SIGNED 08/15/2017		31b. NAME OF CONTRACTING OFFICER (Type or print)			



CREATIVE DATA AND ANALYTICAL SOLUTIONS

August 15, 2017

Diana T. Weiss

Contract Specialist

Pretrial Services Agency for DC

633 Indiana Avenue, N.W. Suite 1133

Washington, DC 20004

Dear Ms. Weiss:

Please find attached a proposal Maxarth LLC is submitting in response to solicitation PSA17Q0034 issued by the Pretrial Services Agency for the District of Columbia. Maxarth LLC is a Maryland-based data & analytics firm. We have been in operation since 2008 and have successfully conducted numerous projects of the size and scope PSA is seeking. We are a minority owned small business concern and Maxarth LLC was accepted into SBA's 8(a) program in July 2014. Maxarth LLC's corporate capabilities statement is attached to this proposal as an appendix.

Please do not hesitate to contact me if you need additional information about Maxarth LLC or this proposal. I look forward to hearing from you and working with PSA again.

Thank you.

Sincerely,

(b)(6); (b)(7)(C)

Avinash Bhati, PhD
President Maxarth LLC
(301) 873-1898
abhati@maxarth.com

Pretrial Services Agency for the District of Columbia Risk Assessment Instrument Revalidation Study

Project Summary:

The Pretrial Services Agency for the District of Columbia is seeing to revalidate and enhance its risk assessment and recommendation protocols. The main goal of this project is to provide PSA consulting services in order to assist it in meeting three objectives:

1. Revalidate the existing instrument and revise the underlying weighting schemes by including, if needed, additional static and dynamic predictors;
2. Assess the adequacy of PSA's release conditions recommendation matrix and ensuring it aligns with the revalidated instrument; and
3. Ensuring that the risk assessment protocols used by PSA are not inadvertently biased against any groups (racial or socioeconomic).

Maxarth LLC is proposing to provide the needed service over a 12-month period. The project will rely heavily on data in PRISM—PSA's rich data warehouse—while leaving open the possibility of using data in additional sources. Given the related nature of the three objectives, the proposed project is split into a number of tasks that are organized to (i) maximize PSA staff and leadership input at early stages of the project, (ii) detailed presentations designed to solicit feedback during analysis, and (iii) final in-person presentations to explain study findings and recommendations. All analysis and recommendation will be documented in a final comprehensive report and the racial bias analysis will be documented in a social responsibility report.

Maxarth LLC will provide consulting services to PSA at the end of the project to ensure that the project recommendation and findings are implemented appropriately. The project is expected to result in a revalidated and revised risk assessment instrument that minimizes the chance of producing systematically biased predictions and a revised release condition recommendations matrix that is aligned with the risk assessment instrument.

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PURPOSE, GOALS, AND OBJECTIVES

The Pretrial Services Agency for the District of Columbia (PSA)—an independent entity within the Court Services and Offender Supervisions Agency for the District of Columbia (CSOSA)—developed, validated, and deployed a risk assessment instrument (RAI) in 2012. That instrument has improved PSA’s ability to identify defendants appropriate for release and those more suited for detention. On June 24, 2014, staff completed the 10,000th risk assessment using this instrument. In keeping with standard practice—revalidating actuarial instruments on a regular basis—PSA is in the process of revalidating the RAI and improving its functionality. In addition, PSA is interested in gauging the need to develop customized assessments for specialized sub-populations as well as in gauging the extent of inadvertent bias that might exist in their instrument’s recommendations. Maxarth LLC is pleased to submit this proposal in response to solicitation PSA17Q0034 issued by PSA for expert consulting services.

The main GOAL of this project is to provide PSA consulting services to address three topical areas:

1. *Revalidation of PSA’s risk assessment instrument.* Under this topic, PSA is interested in assessing whether and to what extent the predictive efficacy of its RAI may have degraded since the instrument was last calibrated in 2012. To the extent that it has, PSA would like to re-develop weights and schemas that can attain industry-wide predictive accuracy standards. Besides revalidation of the existing tool, PSA is keen on addressing three additional sub-topics:
 - a. Dynamic risk assessment. PSA is interested in testing whether there might be any benefits to re-assessing defendants on an on-going basis or multiple

times. The current risk assessment strategy is static—in that after a defendant is assessed initially, and a recommendation is made to the judge, PSA does not re-assess the individual irrespective of their success or failure in satisfying their conditions of release. PSA would like to see whether that are instances in which defendants should be re-assessed and, if so, how frequently.

- b. Information about synthetic drugs. PSA is keen to assess if the information gained from their universal screening for synthetic drugs has any implications for risk management.
- c. Specialized sub-population (defendants charged with non-fatal firearms offenses). PSA would like to assess whether and to what extent defendants charged with non-fatal firearm offenses pose special risk of pretrial misconduct and, if so, how this risk may be managed.

2. *Evaluate PSA's multi-dimensional release condition recommendations matrix.*

Under this topic, PSA is interested in assessing whether and to what extent the recommendation matrix is currently utilizes is consistent with its risk assessment instrument and whether it needs to be revised to align better with the tool.

3. *Assess the extent of bias in the instrument.* PSA is interested in assessing whether their RAI may contain unintentional bias. While an actuarial instrument is, by definition, meant to be free of human discretion and associated biases, recent research has shown that an instrument may still make biased recommendations if the data it was estimated from contains historic biases. PSA is interested in

researching this topic and ensuring that its RAI is free of such bias and that it makes socially responsible recommendations.

BACKGROUND

In 2009, the Urban Institute, in partnership with Maxarth, was commissioned by the Pretrial Service Agency for the District of Columbia (PSA) to develop and validate a risk assessment instrument for pretrial defendants. Assessing the defendant's likelihood of appearing in court and his or her danger to the community was of primary interest.

Specifically, areas of focal interest included enhancing the predictive validity of a risk assessment instrument (RAI), developing a specialized RAI for subpopulations of interest to the District, such as defendants charged with domestic violence or defendants testing positive for Phencyclidine (PCP); and validating the RAI while addressing the effect of pretrial supervision and treatment on the risk of pretrial misconduct.

Using administrative records of defendant cases that appeared in dockets filed in the U.S. District Court for the District of Columbia between October 2007 and August 2010, the research team developed risk models based on five domains for risk factors: defendant characteristics (9 factors), prior criminal history (39 factors), instant offense types (14 factors), lockup drug tests (5 factors), and current criminal justice status (3 factors). These risk factors were used to predict five pretrial misconduct outcomes, including (1) failure to appear, (2) any re-arrest, (3) re-arrest for a dangerous/violent/domestic violence crime charge, (4) re-arrest for a domestic violence charge, and (5) persistent drug use, for the general pretrial defendant population as well as six subgroups. The combination of multiple outcomes and subgroups resulted in 11

risk prediction models and resulting scales, all of which predicted the probability of pretrial misconduct fairly accurately.

After developing, validating, and evaluating the risk prediction models, researchers made several recommendations for PSA (Kim, Bhati, and Denver 2012).

These recommendations included:

- The new risk instruments were considerably more effective than the existing risk instrument in predicting the risk of pretrial misconduct.
- The risk of pretrial misconduct among female defendants was better predicted by a specialized RAI for female defendants than the general instrument for all defendants. It was recommended that a female-specific instrument be adopted for use.
- The potential benefit of implementing a specialized instrument for defendants testing positive for PCP did not outweigh the added complexity. Further, its performance in risk prediction was inferior to that of the general instrument. It was recommended that no further consideration be devoted to the special treatment of defendants testing positive for PCP in risk assessment.
- Measuring the risk of re-arrest for certain offenses, especially those involving violence or dangerous crime, better addresses public safety concern. There was a marginal gain in risk prediction by focusing on re-arrest for such offenses, as opposed any re-arrest. It was recommended that PSA consider a combined use of both instruments predicting the risk of any re-arrest and the risk of re-arrest for more dangerous offenses.

- The risk of re-arrest was found to fade out substantially within the first 30 days of pretrial release, after which point the risk of re-arrest remained fairly stable for several months. Hence, there was little or no need to conduct on-going risk assessment or dynamic assessment. It was recommended, however, that following pretrial release, a 30-day follow-up review for risk adjustment, conditional on compliance with supervision conditions, be considered for implementation.

PSA management adopted several of these recommendations and a revised, validated pretrial RAI was deployed in 2012.

While staff and management were generally satisfied with the performance of the validated instrument over the next few years there were some lingering concerns. In 2014, PSA contracted with Maxarth LLC to study some of these issues and provide recommendations where there was scope for improvement. PSA's Office of Strategic Development (OSD) prioritized the following three topics for closer examination:

1. Scoring of individual items in the risk assessment scheme.
2. Cut-points for each of the risk assessment instruments.
3. Combining the recommendations from multi-dimensional risk assessments.

Unlike traditional instruments, PSA's RAI assess the risk of a client along multiple dimensions. There are 4 separate risk assessments computed for each defendant—(i) failure to appear (FTA), (ii) re-arrest for any offense, (iii) re-arrest for dangerous, violent, or domestic violence offense, and (iv) among those charged with a domestic violence charge, re-arrest for another domestic violence offense. A multi-dimensional RAI like this provides keener insights into the *type* of risk a client poses. However, it can be harder to utilize a multi-dimensional RAI because it may provide

ambiguous classifications—a defendant might be high risk on one dimension but low on another. While it is mechanically possible to collapse the multiple dimensions into a single assessment, knowing the underlying multi-dimensional risk profile is extremely useful for making supervision recommendations. PSA has adopted a hybrid approach—the RAI produces risk classifications along four dimensions that are collapsed into a single final classification. This final classification—along with information in a defendant’s case file—is then used to make pretrial release and program recommendations.

Maxarth LLC provided consulting services to PSA and examined the three topics of interest to PSA management (Bhati 2015). Based on that analysis, it was recommended to PSA that:

1. The scoring scheme be left as is because the weights were mostly consistent with theoretical expectations and the few that were did not affect predictive efficacy at all and should be revisited at the time of a full revalidation study;
2. The cut-points for classification were largely satisfactory and, while some improvements could be made by revising them, such revisions should be undertaken at the time of a full revalidation study; and
3. PSA should consider adopting a three-step approach to better utilize the multi-dimensional assessment at its disposal.

With this background, PSA is now in a position to revalidate and enhance its RAI. In addition to the revalidation work, PSA has chosen to enhance its RAI by focusing additional effort on an assessment of (i) defendants charged with non-fatal firearm offenses, (ii) defendant who use synthetic cannabinoids, (iii) the question of dynamic risk

management strategies, (iv) PSA's multi-dimensional release conditions recommendation matrix, and (v) predictive bias in the instrument. While PSA's current RAI is state of the art, the enhancements requested by PSA will truly make its RAI unique among pretrial RAIs nationwide.

The issue of predictive bias has recently received much attention in the media. On a variety of fronts—pedestrian-police contacts (Ridgeway 2007), traffic stops (Lundman and Kaufman 2003), and risk assessment (Angwin et al 2016; Skeem and Lowenkamp 2016; Dieterich, Mendoza, and Brennan 2016)—the legitimacy of the criminal justice system has faced recent challenges that it reproduces patterns of adverse discrimination against disadvantaged groups (e.g., racial minorities), especially black and Hispanic/Latino persons. But there is little agreement as to the definition of what a fair system should look like. There are three criteria that have been developed in the academic literature (Kleinberg, Mullainathan, and Raghavan 2016):

1. *Statistical parity*: Under this criterion, a fair assessment predicts the same proportion of failures (e.g., recidivists or FTAs) for both the group with and without the sensitive attribute. If this between-group parity is not observed in the data, ignoring the predictions of the instrument entirely, then developing an instrument that conforms to this standard necessarily requires some trade-off of accuracy. In the criminal justice context, misclassification comes with the negative externality of diminished public safety.
2. *Balanced predictive value*: Conditional on the assessment's predicted value, the proportion of observed failures among those with and without the sensitive attribute should be equal. In other words, the proportion of cases within each

group who are classified as high risk that actually have a FTA or re-arrest should be the same.

3. *Balanced errors*: Conditional on the observed outcome, the assessment's misclassification rate should be equal for the both groups. Since classification errors are undeserved burdens, in the form of reduced liberty or increased exposure to sanction, the assessment should allocate this error equitably among the groups. In other words, the false positive rates for those classified as high-risk should be the same in different groups (e.g., racial or socio-economic groups).

While each of these three criteria makes sense in different contexts, the relative merits of one over the other are a matter of *choice* and not necessarily *science*. As such, the decision-makers utilizing the actuarial instruments must prioritize what criterion is of more importance to them. Once decided, different methods can be utilized to gauge the presence (and extent) of bias in the instrument. If found, there are a number of analytical techniques that can be used to mitigate the bias.

METHODOLOGY

This section provides details on the proposed methods that will be utilized for this effort. While the methods are described in fair amount of details, these are necessarily tentative. Upon meeting with PSA executives to clarify the scope of the work, some of the methods may be revised.

Data

The project will rely heavily on data present in PRISM (Pretrial Real-time Information System Manager)—the fairly detailed administrative data system used by PSA. PRISM contains rich data on (i) the current risk assessment measures, (ii) client

demographic information, (iii) criminal history, (iv) drug use, (v) conditions of supervision, (vi) compliance information, (vii) scheduled hearing data, (viii) appearance of failure to appear data, (xi) re-arrests, and (x) disposition data.

Given the goals of this project, as well as our familiarity with the PRISM system, we believe that data contained in PRISM will be sufficient. However, we will work with PSA IT staff should other data be available that might provide insights into any of the topic areas under study.

In consultation with PSA staff, we will define a recent cohort of defendants for whom complete PRISM data is available. These data will be extracted from the system and used for the analysis. Different cohorts might be needed for the different topical areas and we will work with PSA to make the best use of all available data.

Analytical Methods

There are three main types of analytical methods we envision utilizing for this research project. These relate to PSA's topic areas of interest. Each is described briefly below.

- *Revalidation.* For the revalidation effort, we will rely on standard methods to assess the adequacy of PSA's RAI as well as to enhance it.
 - This will include an assessment of changes in the underlying populations and outcomes since the last validation effort. For example, Kim, Bhati, and Denver (2012) contains detailed tables on the distribution of underlying data elements (attributes and outcomes) at the time of that study. Replication of the same attributes and outcomes with the more recent cohort will suggest if there

have been changes in the underlying population, the outcomes of interest, and/or the relationships between the predictors and the outcomes.

- Irrespective of changes in the underlying population, we will conduct a ROC (Receiver Operating Characteristic) analysis and compute AUC (Area Under the Curve) scores to assess if the several risk scores computed (and risk categories created) are still predictive of the outcomes. This is a true out-of-sample test as the risk scores were computed from weights estimated in 2012. We will assess if these weights continue to predict the outcomes in more recent years.
- We will utilize the same procedure used in the initial validation effort to develop weights and scores with the newer data to re-construct weights and assess if these revised weights produce more accurate predictions. If they do, we will also conduct a comparative analysis to assess the extent of recommendation changes that might ensue if revised sets of weights are introduced. While improved accuracy is always preferred in a revalidation effort, researchers need to guard against excessive reclassification of defendants. Excessive reclassification would typically be observed only if the underlying population has shifted considerably between the original validation and revalidation efforts. We will tabulate and study patterns of any systematic reclassifications before recommending a revised set of weights.
- Specialized analysis will be conducted to either include information on synthetic drugs and defendants charged with non-lethal firearm offenses into models or to study them as specialized sub-groups.

- *PSAs release conditions recommendation matrix.* PSA routinely recommends a combination of conditions of release for defendants who are not detained (or for whom they make no recommendations) and those that are not released on their own recognizance. These conditions might include, for example, combinations of curfew (HISP or non-HISP), substance abuse testing, substance abuse treatment, reporting requirements, or stay away orders. It is unclear how these recommendations align with the misconduct risk the defendants pose. Because defendants recommended for different conditions can and will have different attributes, a simple comparison of their misconduct rates might not provide the needed insights—that might result in comparing apples and oranges. As such a quasi-experimental design will be employed for this analysis. Models will be developed that relate risk of misconduct with defendant attributes and conditions of release so as to isolate any links. Once these models are developed, simulations will be conducted to assess the best set of recommendations that might help best manage risk. The simulations will be *resource constrained* so that they provide PSA leadership guidance of the best decision given existing resource constraints. Several simulated variants of the matrix will be developed and compared in terms of their ability to effectively manage risk. Empirical data and leadership feedback will be used to recommend the best solutions.
- *Predictive Bias.* As noted in the previous section, solutions to predictive bias are feasible once decision-makers make some choices in terms of their priorities. We propose the following approach for this topic area.

- Each of the types of bias will first be tested and estimated using the data and their consequences will be demonstrated to PSA leadership. Using empirical data, estimates of the various solutions will also be developed and shared with PSA leadership.
- Once leadership has a clear understanding of the choices they face and their consequences, bias-reducing algorithms will be used to redevelop weights/scores such that the best possible balance between bias reduction and predictive accuracy is achieved. Typically these methods use re-weighting techniques so as to re-calibrate the data in ways to remove association between the protected factors (like race) and the outcomes of interest (like misconduct) before estimating the scores.
- As a result of this analysis, we will develop for PSA leadership a Social Responsibility Report that is increasingly being recommended by those advocating for fairness and accountability in machine learning (see, for example, www.fatml.org). To preempt public scrutiny, PSA can disseminate this report along with the revalidation report. In the spirit of fairness and accountability, the report presents data on a comparison of average outcomes and prediction errors by different racial or socio-economic groups and lays out the corrective measures that have been taken to ensure PSAs instruments are unbiased.

WORK DEVELOPMENT PLAN

This section presents a proposed task plan for meeting the goals and objectives of the project. Work will be divided into three main categories—planning, analysis, and

dissemination. While the tasks are distinct, we expect a fair amount of overlap as the different phases and tasks feed into one another. This is reflected in the proposed task list and estimated timelines presented in Table 1. We have proposed an aggressive timeline and propose to complete the project within 12 months of contract award. A brief description of the tasks is provided following Table 1.

Table 1: Proposed Task List and Estimated Timeline.

Task #	Task Description	Estimated Timeline											
		Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18
I	PLANNING PHASE												
	I.A Kick off Meeting												
	I.B Review of Existing Instrument/Recommendation Matrix												
	I.C Present Overall Analysis Plan to PSA												
	I.D Acquire Relevant Data												
II	ANALYSIS PHASE (RAI Revalidation)												
	II.A Develop/Share Detailed Analysis Plan with PSA COR												
	II.B Share Initial Findings with PSA												
	II.C Based on Feedback Conduct Final Analysis												
	II.D Present Revalidation Findings to PSA												
III	ANALYSIS PHASE (Release Recommendations Matrix)												
	III.A Develop/Share Detailed Analysis Plan with PSA COR												
	III.B Share Initial Findings with PSA												
	III.C Based on Feedback Conduct Final Analysis												
	III.D Present Release Recommendations Findings to PSA												
IV	ANALYSIS PHASE (RAI Instrument Bias)												
	IV.A Develop/Present Initial Findings re Instrument Bias												
	IV.B Share Different Fairness Solutions/Consequences with PSA												
	IV.C Based on Feedback Conduct Final Analysis												
	IV.D Develop Social Responsibility Report												
V	DISSEMINATION												
	V.A Develop Comprehensive Final Report												
	V.B Review Findings with PSA Leadership												
	V.C Provide Implementation Support to PSA												

TASK I. PLANING PHASE – Estimated Sep 2017 – Oct 2017

TASK I.A. Kick off Meeting: The first task on the project will include much of the planning. We will hold a kick-off meeting with PSA staff and leadership to clarify scope of the work and different analysis requested by PSA.

TASK I.B. Review of Materials: Based on a complete understanding of PSA needs, a review of all relevant materials will be conducted next. This includes the existing risk assessment instrument and its current deployment as well as the release conditions recommendation matrix and its current usage.

TASK I.C. Overall Analysis Plan: An overall analysis strategy and timelines will be developed and shared with PSA. This will help Maxarth LLC plan for the distribution of effort over time and will help PSA plan for deliverables, implementation, and schedule meetings.

TASK I.D. Acquire Relevant Data: The final task in the planning phase will include data acquisition. Since much of the data will be acquired from PRISM and linking with external sources will not be needed, we will request de-identified data to protect the confidentiality of defendants. However, identifiers needed to track defendants dynamically while they are under PSA supervision will be requested. We will work with PSA IT and research staff to establish the best format for this data to be transferred. For example, depending on the analysis in questions we might obtain data extracted and converted into a single file or we might obtain data in relational tables that can be linked up at analysis time. All data requests will be made keeping the burden on PSA IT staff in mind. To ensure data security, we will follow an established data security plan. See Appendix for details.

TASK II. ANALYSIS PHASE (Revalidation work)—Estimated Oct 2017-Jan 2018

TASK II.A. Develop Detailed Analysis Plan. The first step will be to develop and share with PSA COR a detailed revalidation analysis plan that takes into consideration any

nuances unearthed during meetings with PSA leadership and staff as well as any specialized data limitations.

TASK II.B. Share Initial Findings: The next step in the revalidation effort will be to develop tables of distributions of the attributes and outcomes and do a comparative analysis with data from the last validation effort. This task will involve conducting ROC analysis and computing AUC statistics to gauge the predictive efficacy of the existing instrument without any changes. This task will also include the analysis to assess the desirability of including information about synthetic drugs and defendants charged with non-lethal firearm charges. These findings will be shared with PSA.

TASK II.C. Conduct Final Analysis: Based on feedback from PSA, the next step will be to conduct revised analysis and develop revised set of weights (if needed) to improve the predictive efficacy of the RAI. Based on initial findings, this step will entail including information about synthetic drugs and defendants charged with firearm offenses as additional predictors of risk or the computation of separate scores for these sub-populations.

TASK II.D. Present Findings: Findings of the revalidation effort will be presented to PSA stakeholders.

TASK III. ANALYSIS PHASE (Release Recommendations Matrix)—Estimated Dec 2017-Mar 2018

TASK III.A. Develop Detailed Analysis Plan. Based on a review of the materials, availability of data, and PSA leadership feedback, a revised/final analysis plan will be shared with PSA COR.

TASK III.B. Share Initial Findings with PSA COR: Next, the analysis described in the methodology section will be conducted and initial findings will be shared with PSA. This includes a comparison of some defendant profiles under different release conditions and a comparison of the misconduct rates. Where these comparisons are not feasible directly, regression analysis will be conducted to control for relevant attributes.

TASK III.C. Conduct Final Analysis: Based on the feedback from PSA, final analysis will be conducted. This will include comparisons of several variants of the existing recommendations matrix under resource constraints so that the total number of defendants recommended for various conditions remains constant. Similarly, based on feedback from PSA, we will develop simulations of scenarios where the resource constraints might be relaxed should PSA be interested in reducing/enhancing its reliance on one or the other recommendations types/categories.

TASK III.D. Present Findings: Findings of the evaluation of the adequacy of PSAs release recommendation matrix will be presented to PSA stakeholders.

TASK IV. ANALYSIS PHASE (Predictive Bias) – Estimated Feb 2018-Jun 2018

TASK IV.A. Develop/Share Initial Findings re Bias: As a first step under this task, we will develop a series of tables and run tests to ascertain the extent of bias (along race, gender or socio-economic criteria). These tables will demonstrate the extent of the bias, if it exists, and the dimensions (scores) along which it might exist. These findings will be shared with PSA.

TASK IV.B. Share Different Possible Solutions: As noted in the methodology section, depending on the type of bias PSA's instrument might contain and the type of bias PSA

finds most egregious, different corrective measures are possible. Under this task, we will present different solutions to PSA and demonstrate the consequences of these corrective measures. This will allow PSA to make an informed decision about how best they want to deal with bias, if it exists, in their instruments.

TASK IV.C. Conduct Final Analysis: Based on the initial analysis and PSA's priorities we will conduct final analysis. This task will result in a revised set of weights/scores that account for any corrective measures taken to eliminate bias from the instrument.

TASK IV.D. Develop Social Responsibility Report: A report documenting the efforts to uncover and eliminate bias (along race, gender or socio-economic status) from PSAs instruments will be developed and comparative analysis tabulated in this Social Responsibility Report.

TASK V. DISSEMINATION—Estimated Jun 2018-Sep 2018

TASK V.A. Comprehensive Final Report(s): The findings, recommendations, and presentations developed under each of the previous tasks will be combined into one comprehensive research report and be presented to PSA leadership for review.

TASK V.B. Review Findings with Leadership: Once PSA leadership has reviewed this comprehensive report a final presentation will be scheduled. At this presentation, PSA leadership and stakeholders will have the opportunity to clarify any of the analysis conducted as well as their policy or practical implications. Much of this material will have been shared with them prior to this presentation. However, this final presentation will allow them an opportunity to make final comments as well as decide on follow-on work as necessary.

TASK V.C. Implementation Support: We will take the comments made by PSA leadership and stakeholders and revise the final report. In addition, under this task, Maxarth staff will work with PSA operations and IT staff to implement any of the recommendations. Maxarth staff will also work with PSA research staff should they be interested in converting any of the findings and reports into publications for wider dissemination outside of PSA.

GENERAL TASKS—Ongoing

Regular meeting will be schedule to keep the PSA COR updated on analysis progress and challenges. A quarterly progress report will be submitted to the PSA COR.

APPENDIX A: SELECTED REFERENCES

- Angwin, J., Larson, J., Mattu, S., and Kirchner, L. (2016). Machine bias. Available: <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>.
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APPENDIX B: ENSURING DATA INTEGRITY AND SECURITY

To the extent possible, we will utilize data that is not identifiable to an individual. This will mean any data we acquire from PSA will be de-identified (all names and other readily identifiable information will be removed). Despite that, we will ensure that all data are analyzed on a password-protected computer and any data stored on external media (e.g., CDs or DVDs) will be stored in a locked secure location. Upon the completion of the project, we will either return all such external media to PSA or destroy them. All data acquired from PSA for the project will also be deleted from all computers and either returned to PSA or destroyed permanently. All personnel (contractor staff or consultants) will be required to sign a data confidentiality pledge prior to gaining access to data.

APPENDIX C: PROJECT MILESTONES AND DUE DATES

Table 2: Project tasks, milestones, and estimated due dates.

Task #	Task Description	Due Date
I	PLANNING PHASE	
I.A	Kick off Meeting	9/7/17
I.B	Review of Existing Instrument/Recommendation Matrix	9/14/17
I.C	Present Overall Analysis Plan to PSA	9/30/17
I.D	Acquire Relevant Data	10/10/17
II	ANALYSIS PHASE (RAI Revalidation)	
II.A	Develop/Share Detailed Analysis Plan with PSA COR	10/10/17
II.B	Share Initial Findings with PSA	11/15/17
II.C	Based on Feedback Conduct Final Analysis	1/15/18
II.D	Present Revalidation Findings to PSA	1/24/18
III	ANALYSIS PHASE (Release Recommendations Matrix)	
III.A	Develop/Share Detailed Analysis Plan with PSA COR	12/1/17
III.B	Share Initial Findings with PSA	2/15/18
III.C	Based on Feedback Conduct Final Analysis	3/15/18
III.D	Present Release Recommendations Findings to PSA	3/24/18
IV	ANALYSIS PHASE (RAI Instrument Bias)	
IV.A	Develop/Present Initial Findings re Instrument Bias	3/31/18
IV.B	Share Different Fairness Solutions/Consequences with PSA	4/30/18
IV.C	Based on Feedback Conduct Final Analysis	6/15/18
IV.D	Develop Social Responsibility Report	6/24/18
V	DISSEMINATION	
V.A	Develop Comprehensive Final Report	7/24/18
V.B	Review Findings with PSA Leadership	8/10/18
V.C	Provide Implementation Support to PSA	9/1/18

APPENDIX D: QUALITY ASSURANCE SURVEILLANCE PLAN (QASP)

Table 3: Quality Assurance Surveillance Plan (QASP)

Deliverable	Performance Standard	AQL	Monitoring Method	Performance Incentive or Reduction
Quarterly status reports by 5:00 pm on the last business day of every third month; Meet with COR and relevant staff by telephone quarterly to check the status and progress of the project.	Brief progress report; quarterly meetings held.	95-100% of meetings are held consistently every third month.	COR feedback.	Revised schedule or positive/negative performance evaluation.
Research design, including evaluation model and data collection strategy.	Written report.	100% comprehensive report addressing all areas is submitted.	COR review and feedback.	Revised schedule or positive/negative performance evaluation.
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation and power point slides.	100% in person verbal presentation and power point slides.	COR and PSA leadership feedback.	Revised schedule or positive/negative performance evaluation.
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation.	100% in person verbal presentation and meeting.	COR and select PSA staff feedback.	Revised schedule or positive/negative performance evaluation.
Presentation of analysis findings to PSA management as scheduled by contractor and COR.	Verbal presentation.	100% in person verbal presentation and meeting.	COR feedback.	Revised schedule or positive/negative performance evaluation.
Final report within 12 months of contract award. Report will describe analysis, present tables of results, finalized recommended risk assessment instrument, recommendation matrix, and predictive bias findings.	Written report.	100% comprehensive report.	COR review and feedback.	Revised schedule or positive/negative performance evaluation.

APPENDIX E: COST PROPOSAL

Table 4: Cost Proposal.

Direct Labor			
<i>Labor Category</i>	<i>Hours</i>	<i>Rate</i>	<i>Total</i>
Principal Investigator (Dr. Bhati)	(b)(4)		
Total Direct Labor =			(b)(4); (b)(7)(C)
Other Direct Costs (ODC)			
<i>Cost Description</i>	<i>Units</i>	<i>Rate</i>	<i>Total</i>
Senior Consultant (TBD)	(b)(4)		
Materials			\$0.00
Equipment			\$0.00
Total ODC =			(b)(4)
Overhead and G&A			
<i>Base description</i>	<i>Base Amount</i>	<i>Rate</i>	<i>Total</i>
(b)(4)			
Profit & Fee			
<i>Base description</i>	<i>Base Amount</i>	<i>Rate</i>	<i>Total</i>
(b)(4)			
Project Total			\$254,858.40

APPENDIX F: PROPOSED PAYMENT SCHEDULE

Table 5: Proposed Payment Schedule

Payment #	Invoice Date	Amount	Tasks completed
1	30-Sep-17	(b)(4)	Kick-off meeting and analysis plan submitted.
2	31-Oct-17		Data acquired, processed, and tested for adequacy.
3	30-Nov-17		RAI revalidation initial findings shared with PSA.
4	31-Dec-17		Recommendation matrix reviewed and analysis plan submitted.
5	31-Jan-18		RAI revalidation in-person presentation.
6	28-Feb-18		Recommendation matrix initial findings shared with PSA.
7	31-Mar-18		Recommendation matrix analysis in-person presentation.
8	30-Apr-18		Predictive bias initial findings shared with PSA.
9	31-May-18		Predictive bias alternate strategies shared with PSA.
10	30-Jun-18		Predictive bias analysis in-person presentation.
11	31-Jul-18		Comprehensive final report submitted.
12	31-Aug-18		Comprehensive final in-person presentation to stakeholders.
13	30-Sep-18		Implementation consultation completed.
		\$254,858.40	Total

APPENDIX G: KEY PERSONNEL

Avinash Bhati, PhD

Principal Investigator

President, Maxarth LLC

12215 Fellowship Lane,

North Potomac, MD 20878

abhati@maxarth.com

(301) 873-1898

AVINASH BHATI, PHD

PRESIDENT, MAXARTH LLC

(CEL)

EDUCATION

- Ph.D. Economics (May 2001), College of Arts and Sciences, American University, Washington, DC.
Dissertation Title: "Environmental heterogeneity in models predicting criminal recidivism: Isolating the contribution of individual level characteristics."
Advisory Committee: Amos Golan (Chair), James F. Lynch, and Robert M. Feinberg.
- M.B.A. Finance (1993), College of Business and Public Management (COBPM), University of the District of Columbia, Washington, DC.
- B.A. History/Political Science (1990), Rajasthan College, Jaipur, India.
- Other — *Bayesian Econometrics and Decision Making* (2006), Summer Program in Applied Econometrics, American University, Washington, DC (Instructor: John Geweke).
— *Missing Data* (2003), Washington, DC (Instructor: Paul Allison).

PROFESSIONAL EXPERIENCE

OCT 2008 – PRESENT President,
Maxarth LLC

Maxarth provides creative data and analytic solutions for challenging real-world problems or opportunities. Through research consulting services and direct technical assistance, we provide the empirical analysis needed to make difficult operational and strategic decisions with confidence. Maxarth staff work in close collaboration with a multi-disciplinary network of partners from around the nation. We engage with subject matter experts and technology companies to combine our skills, knowledge, and experience to provide the most timely and relevant analysis. Our clients have included the Court Services and Offender Supervision Agency (CSOSA) and the Pretrial Services Agency (PSA) for the District of Columbia, Center for Education and the Workforce (Georgetown University, DC), Research and Evaluation Center (John Jay College of Criminal Justice, NY), Center for Advancing Correctional Excellence (George Mason University, VA), Justice Policy Center (The Urban Institute, DC), Pretrial Justice Institute, PEW Charitable Trusts, National Center for State Courts, Florida State University, and numerous individuals.

MAY 1999 – SEP 2009 Research Associate, Senior Research Associate (Jan 2007 – Sep 2009)
Justice Policy Center, The Urban Institute, Washington, DC

As Research Associate at the Justice Policy Center, I supervised and undertook all aspects of quantitative research. Projects I have led or contributed to included such topics as the evaluation of programs aimed at reducing crime; analysis of sentencing outcomes; spatial analysis of crime; understanding supervision failure, modeling individual offending patterns; and the development of innovative analytical methods for analyzing crime and justice related issues.

APPOINTMENTS

JUL 2015 – PRESENT	<i>"Research Affiliate"</i> Maryland Data Analysis Center (MDAC), Department of Criminology and Criminal Justice, University of Maryland, College Park, MD.
OCT 2013 – MAR 2015	<i>"BJS Visiting Fellow: Criminal Justice Statistics Program"</i> Bureau of Justice Statistics, Office of Justice Programs, Washington, DC.
OCT 2010 – MAR 2013	<i>"BJS Visiting Fellow: Corrections"</i> Bureau of Justice Statistics, Office of Justice Programs, Washington, DC.
MAY 2010 – FEB 2012	<i>"Data Analysis Expert – Jerry M., et al., v. District of Columbia, et al."</i> Office of the Special Arbiter, Washington, DC

RESEARCH PROJECT EXPERIENCE

AUG 2015 – MAR 2017	<i>"Simulating Public Safety Implications of Altering Length of Stay in Prison"</i> Justice Policy Center, Urban Institute, Washington, DC Maxarth LLC developed a set of models for simulating the public safety implications of reducing prisoner length of stay.
OCT 2015 – OCT 2016	<i>"Auto Screener: Validating Offender Risk and Needs Assessments"</i> Court Services and Offender Supervision Agency for the District of Columbia Maxarth LLC developed supervised and unsupervised learning algorithms to produce state of the art offender risk and needs assessments for the agency.
JAN 2014 – PRESENT	<i>"Measuring Success in Focused Deterrence"</i> Temple University, Philadelphia, PA Maxarth LLC partnered with Temple University in its efforts to measure the impacts of focused deterrence initiatives undertaken by the Philadelphia Police Department.
JUL 2010 – PRESENT	<i>"Risk-Needs-Responsivity Simulation Tool"</i> Center for Advancing Correctional Excellence (ACE!), George Mason University, Fairfax, VA Maxarth LLC is partnering with ACE! to develop, validate, and deploy an online simulation tool designed to help justice practitioners make evidence-based offender programming choices.
OCT 2010 – SEP 2012	<i>"Monitoring and Assessing the Effectiveness of Juvenile Justice Sanctions"</i> (with co-PI Dr. Dan Mears) Office of Juvenile Justice and Delinquency Prevention, Office of Justice Programs, Washington, DC Maxarth LLC partnered with the Florida State University in a study describing de-facto juvenile justice sanctioning policies in the state of Florida and to study their effectiveness.
OCT 2010 – MAY 2011	<i>"Evaluating DCPSA's In-House Substance Abuse Treatment Program"</i> Pretrial Services Agency, Court Services and Offender Supervision Agency for the District of Columbia Maxarth LLC partnered with the Urban Institute in conducting a process and outcome evaluation of the agencies in-house substance abuse treatment program (STARS).
MAY 2010 – JUN 2011	<i>"Simulating the Implications of Reducing Length of Stay"</i> Public Safety Performance Project, PEW Charitable Trusts, Washington, DC Maxarth LLC lead an effort to study the public-safety implications of reducing length of stay in prison using data from three states.
OCT 2009 – SEP 2011	<i>"Pretrial Risk Assessment and Validation,"</i> (with co-PI Kideuk Kim of the Urban Institute) Pretrial Services Agency, Court Services and Offender Supervision for the District of Columbia. Maxarth LLC partnered with the Urban Institute to develop and validate a state-of-the-art risk assessment instrument for the District of Columbia's Pretrial Services Agency designed to accurately assess risk of pretrial misconduct (including rearrest and failure to appear in court).

- OCT 2007 – SEP 2009 *"Learning from Multiple Analogies: An Information-Theoretic Framework for Studying Criminal Recidivism," American Statistical Association and the U.S. Bureau of Justice Statistics.*
This study developed a new approach for incorporating knowledge from multiple outcomes into a model for studying event histories (in particular, criminal recidivism).
- OCT 2007 – DEC 2009 *"Quantifying the Specific Deterrent Effects of DNA Databases," U.S. National Institute of Justice.*
This project, funded through the Urban Institute, applied a new modeling techniques to quantify whether and to what extent recording offenders' DNA evidence into a databases (for future searches) deters them from committing crimes.
- OCT 2008 – OCT 2009 *"Evaluating the Kiosk Reporting System for Low-Risk Offenders under Community Supervision," Court Services and Offender Supervision Agency (CSOSA) for the District of Columbia.*
This project utilized administrative data to identify a set of low-risk offenders particularly well suited for inclusion in a pilot study that will replace active supervision (e.g., reporting in person) with passive supervision strategies (e.g., reporting to a Kioks).
- OCT 2006 – SEP 2008 *"Modeling Supervision Failure," Court Services and Offender Supervision Agency (CSOSA) for the District of Columbia.*
A team of Urban Institute researchers developed innovative methods to estimate and validate a supervision risk assessment instrument measuring latent risk of criminal recidivism.
- SEP 2005 – DEC 2007 *"An Empirical Investigation of 'Going to Scale' in Drug Intervention," (with Co-PI: John Roman) U.S. National Institute of Justice.*
Study Co-PIs developed new ways to combine information in multiple nationally representative data sources to provide policy makers estimates of the number of drug dependent offenders that could be effectively served by partnerships between courts and drug treatment.
- JAN 2006 – DEC 2006 *"Estimating the Number of Crimes Averted by Incarceration," U.S. National Institute of Justice, Cost-Benefit Analysis Series, Study 1.*
An innovative method of analyzing criminal history records was developed to produce estimates of the number of crimes averted by incarcerating offenders. Findings were published in a recent special issue of the *Journal of Quantitative Criminology*.
- APR 2005 – JUL 2006 *"Life Interrupted: Studying the Effects of Incarceration on Criminal Trajectories," Data Resources Program, U.S. National Institute of Justice.*
A new data analysis approach was used to assess the effects of incarceration on future individual offending. Findings were published in a recent issue of the *Journal of Criminal Law and Criminology*.
- SEP 2004 – AUG 2006 *"Modeling Limited Discretionary Regimes: An Information-Theoretic Approach," U.S. National Science Foundation, Law and Social Science Program.*
This funding was used to develop new models of judicial discretion that allows researchers to investigate various concerns, possibly competing, that judges may have to simultaneously take into account when sanctioning offenders. Findings are documented in a manuscript currently under review.
- JUN 2003 – OCT 2004 *"Does Post-Prison Supervision Matter?" (with Co-PI: Amy Solomon) The JEHT Foundation, New York.*
For this project secondary data was used to assess the effects of prisoner release mechanism on the risk of re-offending. (Final report: <http://www.urban.org/url.cfm?ID=311156>).
- MAY 2002 – OCT 2003 *"Robust Spatial Analysis of Rare Crimes: Modeling Disaggregated Homicide Rates." Mapping and Analysis for Public Safety program, U.S. National Institute of Justice.*
This project developed an innovative statistical procedure for investigating the determinants of rare crimes. Findings were published in a recent volume of *Sociological Methodology*.

PEER-REVIEWED PAPERS

- Mears, D. P., Cochran, J. C., Bales, W. D., and Bhati, A. S. (2016) "Recidivism and Time Served in Prison" *Journal of Criminal Law and Criminology*, 106(4): 83 - 124.
- Bhati, A. S., and Roman, C. G. (2014) "Evaluating and Quantifying the Specific Deterrent Effects of DNA Databases" *Evaluation Review*, 38(1): 68 - 93.
- Mears, D. P., Cochran, J. C., Stults, B. J., Greenman, S. J., Bhati, A. S., and Greenwald, M. A. (2014) "The 'True' Juvenile Offender: Age Effects and Juvenile Court Sanctioning." *Criminology*, 52(2): 169-194.s
- Bhati, A. S., Crites, E. L., and Taxman, F. S. (2013) "RNR Simulation Tool: A Synthetic Dataset and Its Uses for Policy Simulations" in *Simulation Strategies to Reduce Recidivism* ed. Taxman, F. S., and Pattavina, A. New York, NY: Springer.
- Mears, D. P., Cochran, J. C., Greenman, S. J., Bhati, A. S., and Greenwald, M. A. (2011) "Evidence on the Effectiveness of Juvenile Court Sanctions." *Journal of Criminal Justice*, 39(6): 509-520.
- Bhati, A. S., and Roman, J. (2010) "Simulated Evidence on the Prospects of Treating More Drug-Involved Offenders." *Journal of Experimental Criminology*, 6(1):1-33.
- Bhati, A. S. (2008) "A Generalized Cross-Entropy Approach for Modeling Spatially Correlated Counts." *Econometric Reviews*, 27(4-5):574-595.
- Bhati, A. S., and Piquero, A. R. (2007) "Estimating the Impacts of Incarceration on Subsequent Offending Trajectories: Deterrent, Criminogenic, or Null Effects?" *Journal of Criminal Law and Criminology*, 98(1):207-253.
- Bhati, A. S. (2007) "Estimating the Number of Crimes Averted by Incapacitation: An Information-Theoretic Approach." *Journal of Quantitative Criminology*, 23(4):355-375.
- Mears, D. P., Scott, M. L., and Bhati, A. S. (2007) "Opportunity Theory and Agricultural Crime Victimization." *Rural Sociology*, 72(2):151-184.
- Mears, D. P., Scott, M. L., and Bhati, A. S. (2007) "A Process and Outcome Evaluation of an Agricultural Crime Prevention Initiative." *Criminal Justice Policy Review*, 18(1):51-80.
- Mears, D., and Bhati, A. S. (2006) "No Community is an Island: The Effects of Resource Deprivation on Urban Violence in Spatially and Socially Proximate Communities." *Criminology*, 44(3):509-547.
- Bhati, A. S. (2005) "Robust Spatial Analysis of Rare Crimes: An Information-Theoretic Approach." pp. 239-301 in *Sociological Methodology*, Volume 35, edited by Ross M. Stolzenberg. Washington, DC: American Sociological Association.
- Golan, A., Bhati, A. S., and Buyuksahin, B. (2005) "An Information-Theoretic Approach for Image Reconstruction: The Black and White Case." pp. 223-230 in *Bayesian Inference and Maximum Entropy Methods in Science and Engineering*, edited by Knuth, Abbas, Morris, and Castle, Melville, NY: American Institute of Physics.
- Bhati, A. S. (2005) "Count Outcomes with Spatial Structures: An Information-Theoretic Approach." 2005 Proceedings of the American Statistical Association, Business and Economics Statistics Section [CD-ROM], Alexandria, VA: American Statistical Association.
- Bhati, A. S., Buyuksahin, B., and Golan, A. (2005) "An Information-Theoretic Approach for Estimation and Image Reconstruction." 2005 Proceedings of the American Statistical Association [CD-ROM], Alexandria, VA: American Statistical Association.

WORKING PAPERS

- Bhati, A. S. "Learning from Multiple Analogies: An Information-Theoretic Framework for Modeling Criminal Recidivism." MPRA Paper No. 11850, <http://mpra.ub.uni-muenchen.de/11850/>
- Bhati, A. S. "Motivational Structures Underlying Judicial Discretion: An Information Theoretic Investigation." MPRA Paper No. 57834, <http://mpra.ub.uni-muenchen.de/57834/>

REPORTS

- *Risk Assessment Tool for the Allegheny County Community Supervision Population*, Final report submitted to the Allegheny County Department of Human Services, Pittsburgh, PA: Oct 2015.
- *A Review of PSA's Risk Assessment Instrument*, Final report submitted to the Pretrial Services Agency for the District of Columbia: Oct 2015.
- *Multi-Component System Dynamics: Studying Dependencies Within and Across Stages of the Federal Criminal Justice System*, Final report submitted to the Bureau of Justice Statistics, Office of Justice Program, Department of Justice, Washington, DC: May 2015.
- *Allegheny County (PA) Pretrial Risk Assessment Instrument Development and Validation Study*, Pretrial Justice Institute, Washington, DC: Dec 2012.
- *Monitoring and Assessing the Effectiveness of Juvenile Justice Sanctions*, Final report submitted to the Office of Juvenile Justice and Delinquency Prevention, Washington, DC: Oct 2012 (Co-authored with Dan Mears, Josh Cochran, and Sarah Greenman).
- *Assessing the Need for Group-Specific Risk Assessment Instruments for AutoScreener*, Final report submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: Aug 2012 (Co-authored with Afi Harrington).
- *Development and Validation of Risk Assessment Instruments for Pretrial Defendants in the District of Columbia*, The Urban Institute, Washington, DC: March 2012 (Co-authored with Kideuk Kim and Megan Denver).
- *The Bronx Defenders Clients Compared with Traditionally Defended Bronx Clients*, Maxarth, LLC, Gaithersburg, MD: Feb 2012 (Co-authored with Nancy Jacobs).
- *Static and Dynamic Risk Suppression: A Regression-Discontinuity Analysis*, Final report submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: Jan 2012.
- *How Much Prison Time is Enough?*, Final report submitted to PEW Charitable Trusts, Washington, DC: Nov 2011 (Co-authored with James Austin and Gerald Gaes).
- *Time Served as a Treatment: Analyzing the Effects of Different Levels of Time Served on Recidivism by Partitioning Time Served and Balancing on the Propensity Score*, Final report submitted to the PEW Charitable Trusts, Washington, DC: Oct 2011 (Co-authored with Gerald Gaes and James Austin).
- *Analysis of Risk and Outcome Data for Youth Link Program, Police Action League (PAL)*, Maxarth, LLC, Gaithersburg, MD: May 2011 (Co-authored with Nancy Jacobs).
- *Exploring Promising Intervention Pathways for High-Risk Offenders*, Final report submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: June 2011 (Co-authored with Afi Harrington).
- *Development of A Validated Risk Assessment Instrument for Maricopa County Adult Probation Pretrial Services Division*, Pretrial Justice Institute, Washington, DC: March 2011 (Co-authored with John Clark).
- *Kentucky Pretrial Risk Assessment Instrument Validation*, The JFA Institute, Malibu, CA: Oct 2010 (Co-authored with James Austin and Roger Ocker).
- *Synthesizing Evidence: An Information-Theoretic Approach*, Final report submitted to the DC Crime Policy Institute, Urban Institute, Washington, DC: Aug 2010.
- *Quantifying the Specific Deterrent Effects of DNA Databases*, Final report submitted to the National Institute of Justice, Washington, DC: March 2010. (<http://www.urban.org/url.cfm?ID=412058>)
- *Simulated Evidence on the Effectiveness of Passive Supervision Strategies*, Final report submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: October 2009.
- *Validating AutoScreener Final Report (Volume II), Technical Report*, Submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: September 2009 (Co-authored with Mark Coggeshall, CSOSA).

- *Validating AutoScreener Final Report (Volume I), Community Supervision Officer Perceptions*, Submitted to the Court Services and Offender Supervision Agency for the District of Columbia, Washington, DC: September 2009 (Co-authored with Michelle Burk-Storer and Mark Coggeshall).
- *To Treat or Not To Treat: Evidence on the Prospects of Expanding Treatment to Drug-Involved Offenders*, Final report submitted to the National Institute of Justice, Washington, DC: April 2008 (Co-authored with John Roman and Aaron Chalfin). (<http://www.urban.org/url.cfm?ID=411645>)
- *Alcohol Outlets as Attractors of Violence and Disorder: A Closer Look at the Neighborhood Environment*, Final report submitted to the National Institute of Justice, Washington, DC: April 2008 (Co-authored with Caterina Roman, Shannon Reid, and Bogdan Tereshchenko). (<http://www.urban.org/url.cfm?ID=411663>)
- *An Information Theoretic Method for Estimating the Number of Crimes Averted by Incapacitation*, Final report submitted to the National Institute of Justice, Washington, DC: June 2007. (<http://www.urban.org/url.cfm?ID=411478>)
- *A Process and Impact Evaluation of the Agricultural Crime, Technology, Information, and Operations Network (ACTION) Program*, Final report submitted to the National Institute of Justice, Washington, DC: August 2006 (Co-authored with Dan Mears and Michelle Scott). (<http://www.urban.org/url.cfm?ID=411455>)
- *Policy, Theory, and Research Lessons from an Evaluation of an Agricultural Crime Prevention Program*, Policy brief submitted to the National Institute of Justice, Washington, DC: August 2006 (Co-authored with Dan Mears and Michelle Scott). (<http://www.urban.org/url.cfm?ID=411456>)
- *Studying the Effects of Incarceration on Offending Trajectories: An Information-Theoretic Approach*, Technical report submitted to the Data Resources Program, National Institute of Justice (NIJ), Washington, DC: July 2006. (<http://www.urban.org/url.cfm?ID=411427>)
- *Does Parole Work? Analyzing the Impact of Postprison Supervision on Rearrest Outcomes*, The Urban Institute Press, Washington, DC: March 2005 (Co-authored with Amy Solomon and Vera Kachnowski). (<http://www.urban.org/url.cfm?ID=311156>).
- *Weed and Seed Indicator Project: Report on Enhanced Performance Measure Approaches*, Report submitted to the Executive Office of Weed and Seed (EOWS), Washington, DC: April 2004 (Co-authored with Laura Winterfield, Sinead Keegan, and Terry Dunworth).
- *Gang Reduction Program: Baseline Crime Analysis Reports for North Miami Beach (FL), Richmond (VA), Los Angeles (CA), and Milwaukee (WI)*, Reports submitted to the Office of Juvenile Justice and Delinquency Prevention (OJJDP), Washington, DC: March–April 2004 (Co-authored with Sinead Keegan, Deborah Chester, Karen Beckman, Kevin Roland, Michelle Scott, and Dave Hayeslip).
- *Robust Spatial Analysis of Rare Crimes*, Technical report submitted to the Mapping and Analysis for Public Safety Program, National Institute of Justice (NIJ), Washington, DC: March 2004. (<http://www.urban.org/url.cfm?ID=410988>).
- *An Impact Evaluation of the Maryland Break the Cycle Initiative*, Final report submitted to the Maryland Governors Office of Crime Control and Prevention (GOCCP), Annapolis, MD: June 2003 (Co-authored with Adele Harrell, John Roman and Barbara Parthasarthy). (<http://www.urban.org/url.cfm?ID=410807>).

JOURNAL REVIEWER SERVICES

- Journal of Quantitative Criminology (Editorial board member – 2008 to 2015)
- Criminology
- Social Forces
- Social Problems
- Criminology and Public Policy
- Academy of Criminal Justice Sciences
- Social Science Computing Review
- Addiction



CREATIVE DATA AND ANALYTICAL SOLUTIONS

CORPORATE CAPABILITIES STATEMENT

Maxarth provides criminal justice related data science services to governmental agencies, educational institutions, research centers, international organizations, professional associations, non-profit organizations, for-profit companies and private individuals. We deliver creative data and analytical solutions for challenging real-world problems or opportunities.

Mission: To provide criminal justice clients with the actionable knowledge and practical tools that better equip them to make choices with confidence.

Differentiators:

- Employ modern data science tools.
- Synthesize all available evidence.
- Devise creative solutions.
- Deliver practical data products.

Services: Maxarth staff collaborates with a multi-disciplinary network of partners from around the nation. We combine our skills, knowledge, and experience with subject matter experts to conduct relevant and reliable analysis. Our services include:

- *Data Synthesis and Management* we synthesize information from a variety of data sources; create simulation and optimization tools; and design synthetic decision support systems.
- *Predictive Analysis* we design and undertake risk or needs assessment & validation studies; model, trace, and predict risk trajectories; and generate short-, medium-, or long-term forecasts.
- *Evaluation and Prescriptive Analysis* we evaluate programs, policies, and practices; undertake experimental or quasi-experimental studies; devise micro-simulation tools; and conduct counterfactual policy simulations.
- *Capacity Building* we train clients on the appropriate use of empirical evidence; how to recover robust information from transactional data; practical ways to devise and utilize simulation tools; and to appreciate the powers and limitations of data science.

Past and Current Clients:

- *Government*—U.S. Department of Justice, Court Services and Offender Supervision Agency for the District of Columbia, and Pretrial Services Agency for the District of Columbia.
- *Educational Institutions* Georgetown University; George Mason University; American University; University of Maryland; State University of New York; Florida State University; and Temple University.
- *Research Organizations* Pew Charitable Trusts; Urban Institute; ICF International; RTI International; Center for Education and the Workforce; Center for Advancing Correctional Excellence; Pretrial Justice Institute; and National Center for State Courts.

Sample Past Performance:

- *CSOSA*: The Court Services and Offender Supervision Agency for the District of Columbia has contracted with Maxarth to validate and deploy Auto Screener a state of the art risk and needs assessment software for managing probation and parole populations in the District of Columbia. Maxarth has undertaken numerous such efforts around the nation.
- *USDOJ*: Maxarth president served as a Visiting Fellow at the Bureau of Justice Statistics (U.S. Department of Justice). He brought together data from a diverse array of federal criminal justice agencies and developed data products designed to study dependencies within and across stages of the federal criminal justice system and predict population dynamics.
- *PEW*: The Pew Charitable Trusts contracted with Maxarth to evaluate a number of its Justice Reinvestment Initiatives implemented in several states. Maxarth also developed an innovative simulation model to help Pew quantify the public safety implications of diverting low-risk offenders away from prison toward community-based sanctions.
- *GMU*: Maxarth partners with the Center for Advancing Correctional Excellence (ACE) at George Mason University to develop an innovative data product that powers an online decision support tool for managing correctional populations.
- *UMD*: Maxarth is partnering with the Department of Criminology (University of Maryland) to help launch the Maryland Data Analysis Center (MDAC). Maxarth is assisting MDAC develop data products and tools that can provide researchers, practitioner, and policy-makers with easy access to actionable knowledge about the Maryland Criminal Justice System.

Corporate Data:

<i>Registered Name:</i>	Maxarth LLC
<i>DUNS Number:</i>	829885289
<i>Year Formed:</i>	2008
<i>State of Incorporation:</i>	Maryland
<i>Certification:</i>	SBA 8(a) Maryland MBE/DBE/SBE Virginia Swam/DBE

North American Industry Classification System (NAICS)

541511	Custom Computer Programming Services
541720	R&D in Social Sciences and Humanities
541611	Administrative Management & General Management Consulting Services
518210	Data Processing Hosting & Related Services

Contact Information:

~~201-789-2966~~ ~~201-789-2966~~