

# A SAS Audit Documentation and Management Solution for the Office of the Washington State Auditor (SAO)

RFI K645-RFI-2011 Audit Documentation and Management Software Solution

**Due December 4, 2020**

**Submitted by:**

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## Executive Summary

SAS Institute Inc. (SAS) understands the Office of the Washington State Auditor (SAO) audits approximately 1,900 local governments and 200 state agencies of all types and budgetary sizes to track public dollars and explore good government operations. In 2019, SAO's 350 auditors performed 2,785 audits – including 1,345 accountability audits (82 findings), 365 Federal audits (172 findings), and 790 financial audits (92 findings). Audits are organized into approximately 1,700 audit files and result in over 5,000 recommendations annually. SAO is investigating replacing its current Wolters Kluwers TeamMate Audit Management documentation and management software. SAS is excited to respond to RFI K65-RFI-2011 and share our solution details with SAO.

The SAS Solution is the ideal replacement for SAO as it meets stated current needs and will help SAO auditors work more efficiently. The SAS Solution is a white box solution that securely supports work processes and central data collection for multiple concurrent users. It is fully compatible and integrated with MS Windows and all MS Office Products. The SAS solution supports both online (connected) and offline (no internet) environments and meets SAO's functional and non-functional requirements including:

- ◆ electronic workpaper management
- ◆ user authentication
- ◆ edit/sign-off/review tracking
- ◆ edit history
- ◆ data collection/analysis/reporting

We anticipate it meeting future needs as SAO's initiatives change and additional information becomes available. The SAS Solution is powerful yet simple to use. The SAS solution enables auditors to quickly discover relationships buried within disparate data sources, greatly reducing time spent manually analyzing data. It can be deployed into SAO's daily workflow to catalyze operations. The Solution's off the shelf capabilities are configurable to SAO's specific needs and. The key to project success extends beyond meeting minimum technology requirements and incorporates proven performance and company stability.

SAS is a longstanding partner to the State of Washington, with current SAS licenses being continuously used within Washington State agencies for more than 30 years. Partnership with SAS provides dependability. With nearly 45 years of global leadership in data management and advanced analytics, our longevity is a testament to SAS' superior software and customer service. We understand that not all problems are the same size, but that solving all problems can make a significant and immediate impact on SAO operations and citizen lives. SAS puts data and analytics to action when it matters.

SAS believes that our demonstrated capabilities coupled with our specific knowledge and experience working with the State of Washington presents a unique opportunity to create a complete investigative audit process lifecycle that will increase efficiency at SAO.



## Response to Requirements

### 1. Allows for efficient documentation and review of audit work and recommendations in compliance with professional standards, accommodating a wide variety of external audit types and sizes

The SAS Audit Documentation and Management Solution (SAS Solution) allows the Washington State Auditor's Office (SAO) to fully manage the day-to-day data entry, management, compliance and expected outputs for all audit work. The SAS Solution securely supports work processes and central data collection for multiple concurrent users. It is fully compatible and integrated with MS Windows and all MS Office Products. The SAS solution supports both online (connected) and offline (no internet) environments and meets SAO's functional and non-functional requirements including:

- ◆ electronic workpaper management
- ◆ user authentication
- ◆ edit/sign-off/review tracking
- ◆ edit history
- ◆ data collection/analysis/reporting

Rather than relying on ad-hoc Microsoft Word based templates for tracking audits, SAS provides a highly configurable, modern, web-based solution that guides users through the audit process. Users initiate and manage audits directly within the software itself as shown in Figure 1:

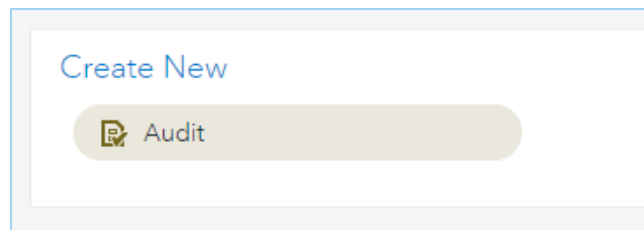


Figure 1. SAO can easily create a new audit in the SAS Solution.

The Solution's included forms and fields can be configured to conduct, track, supervise and manage audits from beginning to end. Templates for varying audit types can be leveraged to ensure the correct information is captured for each audit type. Dynamic rules around mandatory fields ensure nothing is missed.

Any type of information needed for the audit can be easily captured using the Solution's wide array of data entry control types as shown in Figure 2 on the next page. SAO's processes and business model can be defined directly within the software's configurable workflow management module resulting in an operational workflow that is compliant and follows all the necessary steps and guidelines. Auditors and supervisors are guided through the audit with the Solution's task generation capability. The Solution stores a complete history of all actions taken alongside the audit itself to ensure the audit passes through all necessary steps. Remediation steps are captured in separate sections for findings and audit issues and actions. Finally, the Solution can print output with dynamic content from the audit spliced into existing static content with the desired formatting, logos and other required details.

**Audit Details**

Title \*  
City of Seattle Fraud Audit

Government Name  
City of Seattle

Government Type  
City/Town

Lead Auditor \*  
Colin Pearson

Audit Type  
Fraud

Audit Date  
12/1/2020

**Audit Issues**

Audit Issue Date	Audit Issue Type
Dec 1, 2020	Misappropriation of Funds

Auditor  
Colin Pearson

Audit Issue Type  
Misappropriation of Funds

Audit Issue Date  
12/1/2020

Organizational Contact Name  
John Smith

**Summary and Results**

**Investigation Summary**

On June 13, 2019, June 21, 2019, and August 1, 2019, the City notified our Office of potential losses of public funds, as required by state law (RCW 43.09.185).

The City filed a report with the Seattle Police Department, which investigated these cases. The investigation determined a misappropriation of deposits totaling \$5,795 occurred at the City, between September 12, 2018, and June 20, 2019.

The City also hired a consulting services firm in July 2019 to review the City's cash receipting internal controls over the Treasury Cashier Team. The consulting firm identified areas of improvement for payment collections, handling and reporting, and physical access and security for the Treasury Cashier Team. In December 2019, the consulting firm conducted a follow-up assessment and internal control evaluation and observed improvements to controls at the City.

**Background and Investigation Results**

The City collects monies as services occur or payments are assessed and due. In most instances, the City's Treasury Department receives the payments. Other departments might receive payments when the transaction has a point of sale nature. Payments received by other departments are transferred to Treasury for deposit into the bank and for recording into the centralized financial general ledger system.

According to the Treasury Department, in 2018 and 2019, the Parks Department, Police Department and Department of Neighborhoods each dropped off one deposit to the Treasury for which they subsequently reconciled the department subsidiary system to the City's general ledger and notified Treasurer of discrepancies. Specifically:

**Geography Details**

Map showing the City of Seattle and surrounding areas.

Figure 2. A sample SAS Solution audit summary and results form showing the City of Seattle audit.

## 2. Customizable User Interface, perspectives (user views) and terminology that allow the workflow to be customized

The SAS Solution's page builder functionality enables the creation of page views that allow users to gather all the most important pieces of information on any form as shown in Figure 3. As the page builder is built into the application and employs an easy to use drag and drop interface, an administrative user can adjust this view as and when necessary, without the need to involve SAS. Simply dragging a field from the page builder data tab onto the page and saving the page will show this data element on the very next view of every user that needs access to it.

**SAS Visual Investigator - Manage SAS Visual Investigator - Page**

Data Objects Relationships Pages Workflows Alerts Permissions Properties Import Jobs Homepage Intelligence Report Intelligence Report - Full

**Page Properties** **Preview**

Controls Data

**Filter**

**Fields**

- Address
- City
- Created At
- Created By
- Exclude Flag
- Immediate Sup...
- IntelligenceRep...
- Interest Area
- Interest Area Na...
- Keywords
- Last Updated At
- Last Updated By
- Latitude
- Location Descr...
- Location Name
- Longitude
- Mile Marker
- Narrative
- Reasonable Sus...
- Review Date
- Source Agency
- Source Email
- Source Name
- Source Phone
- Source Type
- Start Timestamp
- Status
- Submitting Officer
- Summary
- Version

**Main Details**

**Summary**

Keywords

Start Timestamp

Review Date

Status

Submitting Officer

Select User

Immediate Supervisor

Select User

Source Type

Source Name

Source Phone

Source Agency

Reasonable Suspicion of Criminal Predicate

**Location**

Area

Map showing the location of the audit.

**Activity**

Category

Type

No child objects to display.

**Details**

Additional details will be hidden in view mode, but are required for the edit and create operations.

Category

Type

Figure 3. Customizable page views based on the information needed by the auditor.



The SAS Solution's industry standard Business Process Model and Notation (BPMN) workflow engine creates and manages system workflow. The workflow definition both documents the current business processes of an organization and serves as a working system model that drives the processes themselves through the SAS Solution. Workflows are easily configurable or augmented to add, edit or remove steps to processes. The workflow itself maintains a versioning of previous workflows ensuring previously started workflow can complete without issue while allowing newly created records to use the most up to date version as shown in Figure 4.

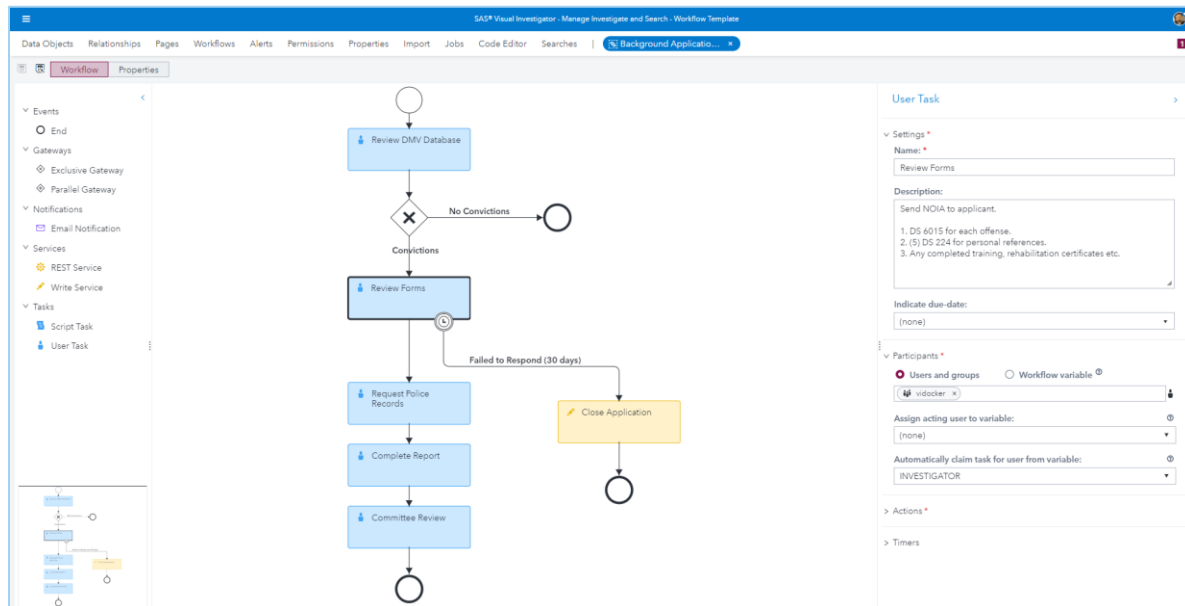


Figure 4. The SAS Solution's workflow process with tasks, dates, participants, assignments and more.

### 3. In addition to laptops and desktop computers, ability to use mobile devices and tablets for access

The SAS Solution offers an option for users with tablets or mobile devices to connect to the mobile user interface, which gives them a simplified set of functions for querying against the system, submitting new records to the appropriate modules and interacting with workflow as shown in Figure 5.

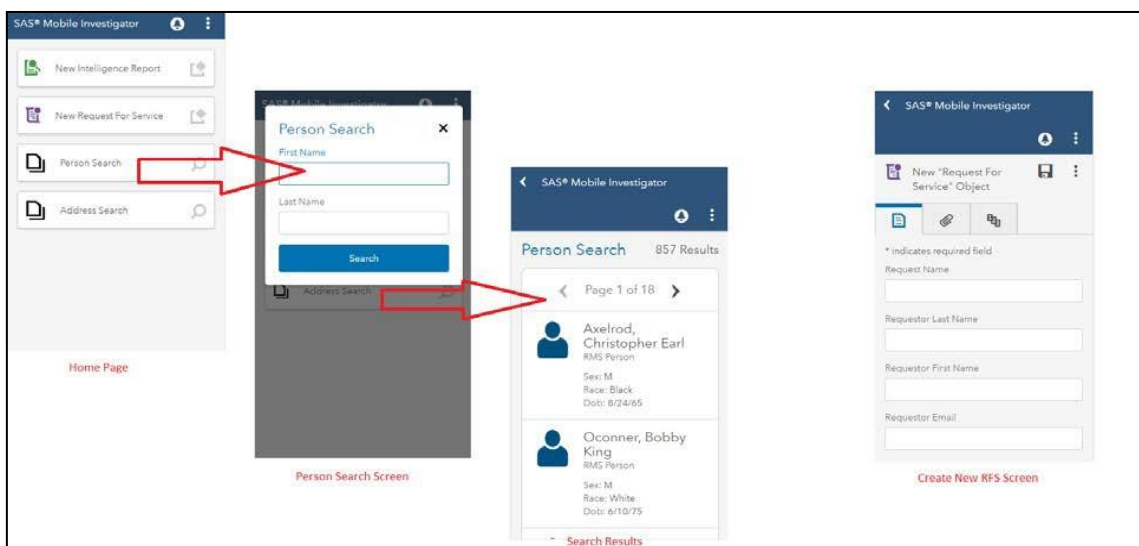


Figure 5. The SAS Solution's mobile device and tablet access screenshots.





4. All associated server environment data (operating system, data base brand and architecture, required framework and/or stack)

The SAS Solution runs on the Linux operating system, either SUSE or RedHat, and utilizes the PostgreSQL 11 database for storing data and metadata. The system is architected using a microservices based architecture which allows for flexibility, scalability and ease of upgrade. The Solution is entirely browser based with all user and administrative functions performed through a web interface without the need to install any desktop client software. The software can be architected in a variety of configurations depending on the needs of the organization, number of required users and estimated data sizes. The Solution can be installed on premises or hosted in the cloud.

5. Ability to operate on current MS Windows 10 OS and future patch releases and updates

The SAS Solution is web based and operates on Windows 10 through either the Microsoft Edge or Chrome Browsers. Windows 10 is the main desktop operating system on which the solution is tested and used and, as such, will continue to be supported through future patch releases and updates.

6. Compatible and fully integrated with latest versions of MS Office Products, including Office 365 (cloud and desktop clients) and Office 2016

The SAS Solution is compatible and allows for full integration of workflows and reports with both desktop and cloud-based Microsoft Office products. Specifically, SAS integrates with 2019 and earlier versions of Microsoft Word, Excel, PowerPoint, and Outlook. Once SAS is installed, an integrated SAS menu and SAS toolbars are available as part of the Office environment. Using the menu and toolbars, SAO can directly access much of the power of SAS natively.

SAS enhances Microsoft Excel data and workflow accessibility by providing the ability to open, query, sort, and browse data via the file system or SAS server accessible data sources of any size directly from Microsoft Excel. This allows the user to bypass Excel's imposed row limits and optimizes data computation speed. Workflows designed on the SAS platform can be imported directly as objects with Microsoft Office forms. The SAS Solution also allows users to export search results from the system itself into Excel if required.

7. Compatible with latest versions of common web browsers (Google Chrome and Microsoft Edge)

The SAS Solution is compatible with, and supported on, the latest versions of Google Chrome and Microsoft Edge.

8. Compatible with common electronic document file types and associated 3rd party software, including but not limited to .PDF portable document files (Adobe and Nitro Pro), .JPEG and BMP digital images, .TXT text files, and .ZIP compressed data files

The Solution supports the uploading, embedding, content extraction and production of PDF and other files. The SAS Solution supports the storage of any file type including, but not limited to, .TXT and .ZIP files. Digital image files can be attached and displayed directly with the SAS Solution (see Figure 6 on the next page).



Figure 6. The Solution's digital image capability.

### 9. Ability to attach external files (i.e. pdf, docx, xlsx, jpg, bmp, tif, etc.) to all work flow items

Any external file type can be easily attached to a workflow item. If the file contains searchable text, it can be extracted and made available for search and display. In addition, the text can be scanned for entities such as Persons, Locations and Organizations, allowing users to extract these entities and structure them out to be matched against existing entity types providing a way of showing relationships between different audits if desired as shown in Figure 7.

Label ↑	↑ ↓	Type
Alex Brown		
Ashley		
Ashley Foster		
Bobby Axelrod		
Brian Davis		
Chase		
Chase Bank		
Cold Springs		
Deer Park		
Deer Park Hotel		
Delaware		
Dover		
East 7th St.		
East River		
Frank Valentine		
Jeffrey Cooper		
Kelly Cooper		

Figure 7. The SAS Solution can attach external files of any type and scanned.

Automated network analysis allows links between persons, locations and organizations to be visualized within the software to increase situational and investigative awareness as shown in Figure 8 on the next page.



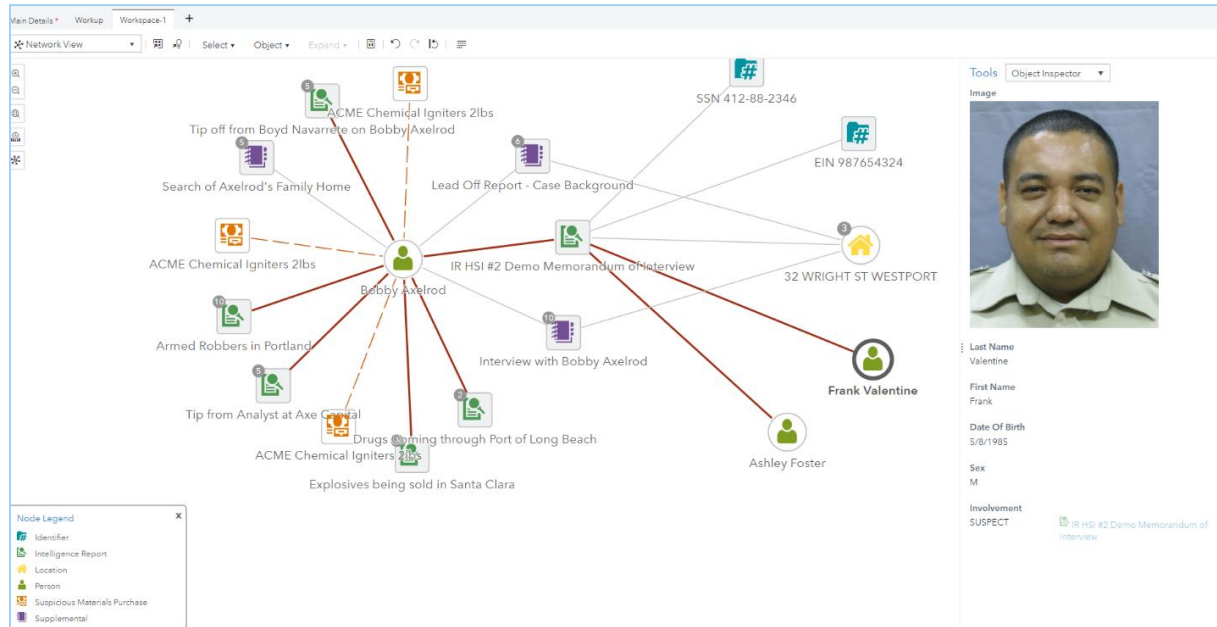


Figure 8. The SAS Solution links networks and can help identify fraud, waste and abuse.

#### 10. Workflow tracking (edit history) including status designations (such as prepared and supervisor reviewed)

The SAS Solution shows a full workflow and status designations such as edit history of all records as shown in Figure 9. Status fields can be tied to workflow transitions such that those values follow the advancement of workflow tasks. All status values can be configured to match those values that are required.


History

Actions

Versions


(all actions)

▶ Attached a file

 Colin Paterson


Oct 29, 2020 12:12:08 PM

▶ Edited the Supplemental

 Colin Paterson

Oct 7, 2020 2:57:44 PM

◀ Edited the Supplemental


 Colin Paterson

Oct 7, 2020 12:30:28 PM

Changed fields:


Field	Original Value	New Value
Video Link	1MKLSgvVgdOc-Moy3kmJ5MKT6ekZOgQOZ	16GxF7Emo9jaULiDRhPmjZdXxA3e0...

▶ Edited the Supplemental

 Colin Paterson


Oct 7, 2020 12:19:22 PM

▶ Edited the Supplemental

 Colin Paterson


Oct 7, 2020 12:19:00 PM

▶ Edited the Supplemental

 Colin Paterson


Oct 7, 2020 12:18:56 PM

▶ Edited the Supplemental

 Colin Paterson

Oct 7, 2020 12:18:30 PM

▶ Edited the Supplemental

 Colin Paterson

Oct 7, 2020 12:12:26 PM

Figure 9. The SAS Solutions' tracking of edit history with status designations.



**11. Electronic workpaper management including version control and automated assignment of workpaper identification numbers (audit reference codes)**

The SAS Solution includes the ability to assign workpaper identification numbers (or audit reference codes) on initial creation of audits. Records are versioned between edits including the user who made the edit and the content of the edit itself.

Field	Version 8 Value	Last Recorded Value
Last Modified Date-Time	Oct 7, 2020 2:57:44.490 PM	Oct 7, 2020 12:30:28.845 PM
	Eddie Van Halen, who has died at the age of 65, opened up dozens of new possibilities for the electric guitar with his wildly inventive, and largely self-taught, techniques. Combining lightning-quick, two-handed picking techniques with hammer-ons, pull-offs, complex harmonics and an array of innovative devices he	

Figure 10. The SAS Solution's electronic workpaper management with version control.

**12. Ability to restrict editing or changes to engagement projects or workpapers for retention purposes (i.e. finalization, freezing or archiving procedures)**

The SAS Solution supports a fully featured security capability which allows editing to be restricted on engagement projects or workpapers based on any combination of field content, user group or role membership, or position within the workflow. Retention is supported through mapping these statuses to visibility and/or editability.

**13. Ability to set engagements and workpapers as confidential (limited or restricted access)**

The SAS Solution's security capability allows engagements and workpapers or any other record types to be set as confidential based on content of the record, manual selection or membership of groups.

**14. Ability to search by keywords, attributes, and/or values**

The SAS Solution features a robust elastic search tool that can search for user entered or predefined keywords, attributes, and values. The Solution contains a wide array of search tools including simple standard full text query and advanced query builders. Searches can also use advanced query tools such as phonetic sound-alike, wildcards, fuzzy matching, temporal and geo-spatial searching as shown in Figure 11 on the next page. A "My Search" capability allows users to save their own queries for later use or socialize them with other users. Administrators can also push out predefined queries to groups of users as desired.

The screenshot shows the 'Advanced Search' window in the SAS Solution. At the top, there's a search bar with 'Audit' entered. Below it, a table of search criteria is displayed:

	Field	Operator	Value	Comparison	Sort	Actions
	Audit Date	Range	11/1/2020 - 11/30/2020			+ -
AND	Government Type	Contains all	City/Town			+ -
AND	Investigation Summary	Contains any	{jon smith}~			+ -

Below the table, a text box shows the generated search query: `+_type:audit +audit_date:[2020-11-01 TO 2020-11-30] +government_type:City/Town +investigation_summary:({jon OR smith}~)`. A link 'Switch to text editor' is present below the text box. At the bottom right, there are 'Search' and 'Cancel' buttons.

Figure 11. The SAS Solution's elastic search is robust, allowing keyword, attribute, and/or value searches.

**15. Ability to meet compliance regimes that may include storage and transmission requirements for health records, payment card information, personally identifiable information, or other types of confidential information**

The SAS Solution supports the requirements set forth by:

- ◆ FBI Criminal Justice Information Service (CJIS)
- ◆ HIPAA
- ◆ Protected Health Information (PHI)
- ◆ Personal Identity Information (PII)

Our Solution will handle the de-identification of sensitive fields during pre-processing to protect the owners of the data while still preserving the meta data needed for accurate processing. This approach combined with data being encrypted at rest and in-flight within the SAS platform, makes our Solution compliant with:

- ◆ 42 CFR Part 2
- ◆ Welfare and Institutions Code 300

SAS recently partnered at the California Franchise Tax Board to perform audits as well as intrusion detection testing on the myFTB self-service site. This site was delivered conforming to FTB and IRS security and compliance standards.

SAS makes reasonable efforts to assist with Federal and State Compliance regimes. SAS does not represent that use of its software will result in Auditor's compliance, fulfillment or conformity with any laws, rules, or regulations.



#### 16. Exception and audit issue tracking for follow-up corrective action

The flexibility of the SAS Solution allows exceptions and audit issues to be tracked and stored alongside the audit itself. Follow up actions and due dates for corrective actions can be assigned either manually or automatically based on action type. The Solution's standard configuration can be easily configured to add new fields that are required for data capture or workflow.

**Edit Audit Issue**

**Auditor \***  
Colin Paterson

**Audit Issue Type \***  
Revenue

**Audit Issue Date \***  
11/23/2020

**Organizational Contact Name**  
Mary Jones

**Remediation Date**  
11/24/2021

**Organizational Contact Phone**  
(555) 123-4567

**Corrective Action**  
Increased Revenue

**Organizational Contact Email**  
mary.jones@colfaxwa.org

**Issue Description**  
The city is not generating enough income to meet scheduled debt payments.

**Save** **Cancel**

Figure 12. The SAS Solution's exception and audit issue tracking allows for assignment of follow-up corrective action.

#### 17. Ability to support real-time digital collaboration through dashboard reports and supervisor reviews (edit comments)

The SAS Solution comes bundled with industry leading dashboarding capability allowing for real time collaboration and supervision as shown in Figure 14. Audits can be displayed by supervisor, by user, by status, by audit type or by any other data elements required as shown in Figure 13. Free form comments can be added to audits in an either categorized or uncategorized format. Additionally, if more control is required the prompting for comments can be tied to workflow status changes allowing supervisors to be prompted for and required to enter supervisory comments.



Comments

(all categories) (2)

Accounting (1)

Grammar (1)

Enter comment

Filter

Expand All

Collapse All

Date ↑

Colin Paterson

Accounting

Accounting accuracy needs to be checked under financial records.

Tuesday, November 24, 2020 5:27 PM

Colin Paterson

Grammar

The grammar in the main report text needs reviewed,

Tuesday, November 24, 2020 5:26 PM

Figure 13. The SAS Solution's real-time digital collaboration.

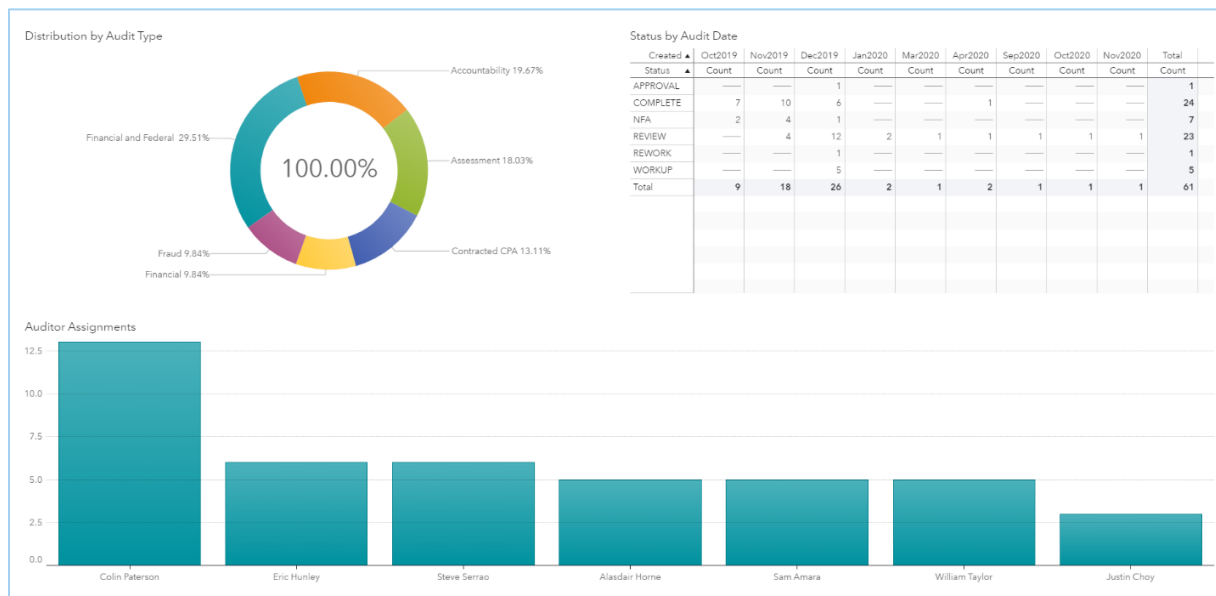


Figure 14. The SAS Solution's sample dashboard report.

### 18. Provide real-time tracking of work flow and project status

The SAS Solution allows SAO to track the status of workflows for auditors, supervisors, direct reports or an organization as a whole in real-time. The reporting and dashboarding capability of the platform also allows you to deliver project status focused dashboards if required as shown in Figure 15 on the next page.



Task Reports    Audit Reports    ↻							
Group	Median Time Per Task		Time on Completed Tasks		Time on Incomplete Tasks		
	Since Started	Since Claimed	Since Started	Since Claimed	Since Started	Since Claimed	
(unclaimed)	186 days 23:25:29 hours			169 days 2:17:13 hours	543 days 1:11:19 hours	169 days 2:17:13 hours	
(ungrouped users)	140 days 12:42:11 hours	140 days 12:42:11 hours		2328 days 18:43:53 hours	2328 days 18:43:53 hours	2328 days 18:43:53 hours	
....							
User	Median Time Per Task		Time on Completed Tasks		Time on Incomplete Tasks		
	Since Started	Since Claimed	Since Started	Since Claimed	Since Started	Since Claimed	
Bill Smith	112 days 23:35:55 hours	112 days 23:35:55 hours		112 days 23:35:55 hours	112 days 23:35:55 hours	112 days 23:35:55 hours	
Colin Paterson	182 days 5:04:26 hours	182 days 5:04:26 hours		1488 days 13:53:52 hours	1488 days 13:53:52 hours	1488 days 13:53:52 hours	
Steve Serrao	115 days 5:07:12 hours	115 days 5:07:12 hours		446 days 3:51:01 hours	446 days 3:51:01 hours	446 days 3:51:01 hours	
Steve Shirley	140 days 12:42:16 hours	140 days 12:42:16 hours		281 days 1:24:31 hours	281 days 1:24:31 hours	281 days 1:24:31 hours	

Figure 15. The SAS Solution's project status focused dashboards.

### 19. Ability to add hyperlinks and bookmarks for cross-referencing and efficient navigation

The SAS Solution support bookmarks and hyperlinks for easily accessing records and information as shown in Figure 16. Hyperlinks on records allows quick navigation between related pieces of information.

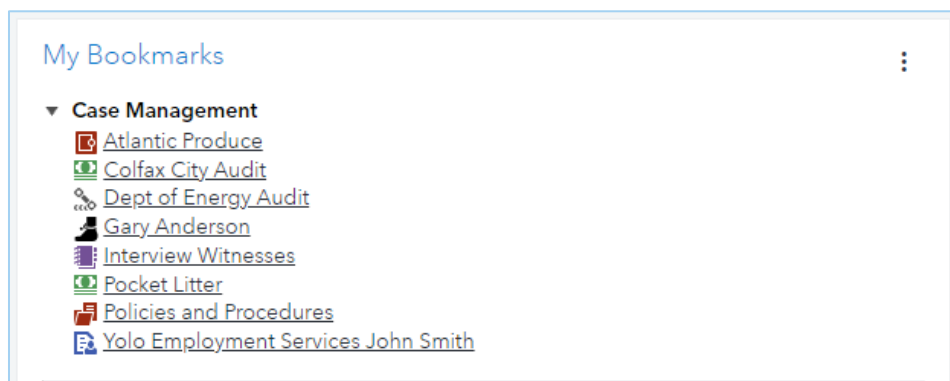


Figure 16. Customized bookmarks for easily accessing information.

### 20. Ability to create and maintain templates of our knowledge base which can be imported into the audit documentation software

Knowledge base templates can be added to the software and accessed through the SAS Solution's lookup capability which allows existing templates to be searched and retrieved as the basis for entering information for new audits.

### 21. Administrative capabilities to establish and update user accounts, system policies, and workflow preferences

System administrators can manage user groups, security roles, other organizations, content access to individual users and data provisions through a single application interface as shown in Figure 17. Along with robust use access controls and automated auditing, our Solution provides a means of provisioning access to datasets, segments of datasets, and derived views. The SAS Solution separates user access of data and content using LDAP authorization groups or active directory groups. System administrators can build custom user groups and edit authorization rights for individual users within each group.





Authentication is handled by connecting to a pre-existing LDAP directory service such as Active Directory or Security Assertion Markup Language to govern user logins.

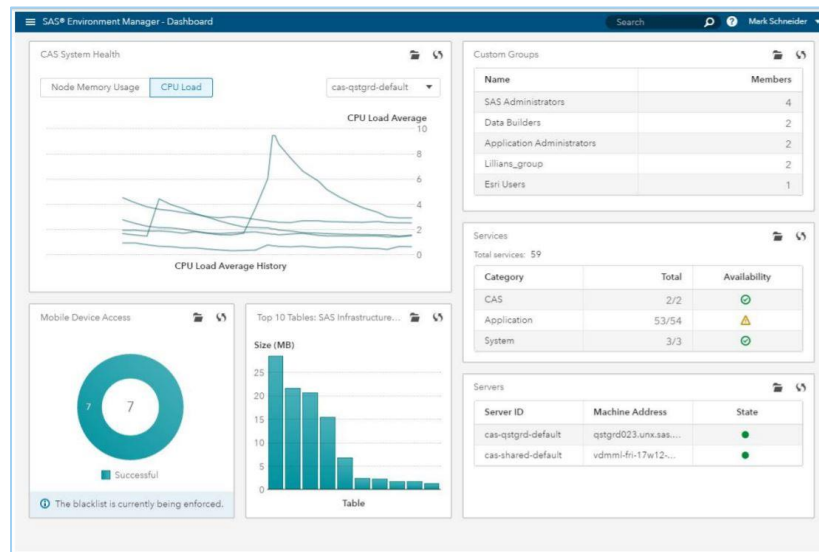


Figure 17. SAS Solution's interface to manager users and policies.

Workflow can be monitored through the SAS platform on both an individual user and role level. System administrators can track user metadata and activity, automated logging and scheduling monitors execution history for individual users. These automated decision workflows can be defined and edited using an interactive, visual environment. Workflows can be routed using business logic and automated emails can be sent to reminder users of upcoming scheduled tasks.

## 22. Administrative rights to specify user access policies and permissions (controlled user access). User permission and access controlled by System Administrator

The SAS Solution employs a declarative security model whereby rules can be applied to any data set within the system which allows access to data to be based on a combination of user roles and field contents. For example, a simple rule might restrict access to any data where the division field within a data set is set to Division A, to the members of the "Division A" security group. These rules can be combined to create a granular approach to user and role security which is independent of the data and easily applied to current and future data sets. These rules are easily created and managed through an administrative front end. Permissions within the system are a set of functional capabilities including but not limited to:

- ◆ search record
- ◆ create records
- ◆ delete records
- ◆ add attachments
- ◆ edit comments
- ◆ print records
- ◆ export data

Any subset of these permissions can be added to a group and users can then be added to groups, granting them all permissions contained within that group. Permissions are additive such that a user will have the sum of all permissions contained within each of the user's membership group.



Users and standard group identities are stored and managed by SAO's LDAP-based identity providers. Some of the more popular identity providers are Active Directory and OpenLDAP. Read-Only access to the provider is required so that SAS can obtain identity information after a user has been authenticated. Using LDAP-based identity providers also supports single sign-on capabilities within our Solution. SAS will work with SAO to develop predefined groups, which provides a way to give users access to specialized functionality out-of-the-box. Encryption of data and content is performed at rest and in-motion and can be configured by system administrators.

*23. Open APIs or other means for integration with other software modules and applications, dashboards and reports*

The SAS Solution has a rich and well documented REST API that allows connectivity between the SAS Solution and other software modules, applications, dashboards or reports. The API covers a wide range of capabilities including search and retrieval, workflow, data ingestion, export and import and a wide range of analytical capabilities. In addition, the SAS Solution can also consume existing REST API's to allow data from external systems to be leveraged within the SAS Solution for search and display of external data or as contributing factors within the workflow.

*24. Ability to copy, duplicate, transfer, and generate printable reports for all work product within the software solution*

The SAS Solution supports copying/duplicating information from any source record to any destination record either in part or in whole. The Solution contains a fully configurable print template capability that allows for the generation of rich printable reports directly within the Solution.

*25. Offline System Capable, without network connection to cloud or main server, while maintaining central database*

The SAS Solution includes a mobile interface that provides a limited range of capability to operate without network connectivity (e.g., create new records offline). These new records can then be automatically submitted and synchronized when network connectivity is restored. During normal operation of the SAS Solution, the system automatically checks for network drops and attempts to reestablish connections and update transactions.

*26. Supports data backup and recovery. Prefer ability to recover individual audit files without having to roll back the entire database*

The SAS Solution provides the resiliency for delivering a highly available and performant system with minimal disruption to the end-users. In a cloud-based environment the Azure infrastructure can be spread across multiple Azure zones to provide geographically isolated redundancy. The pattern of using multiple zones is used to allow compute workloads to shift across zones as needed. Storage redundancy can be provided through the Azure infrastructure where the durability of the underlying storage across zones is defined at 99.999999999 (12 9's).

SAS disaster recovery and business continuity plans meet or exceed common industry practices including frequent production software backups, multiple off-site backup media storage locations, and periodic testing of our recovery procedures.

*27. Auto-Sync Capable with conflict identification and resolution features*

The SAS Solution uses a dynamic and real-time web application where contribution to a specific audit is managed in a transactional fashion thereby negating the need to perform a separate conflict identification or resolution phase.



**28. Ability to import and export (e.g. project rollover) information and work product within the software solution. Please specify acceptable data formats for import/export and inter-application analysis and reporting**

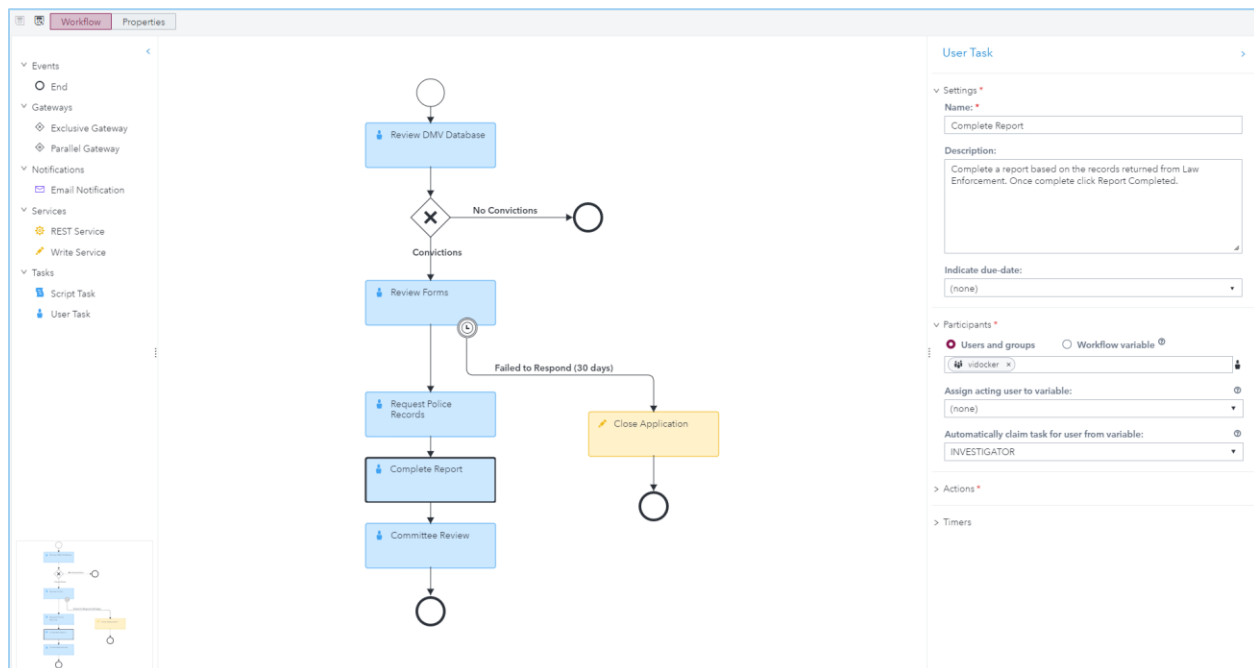
The SAS Solution supports import and export of large numbers of different data formats including but not limited to:

- ◆ XML
- ◆ JSON
- ◆ CSV/Excel
- ◆ PDF
- ◆ Word

Custom data formats can also be easily be defined directly within the user interface allowing different file formats to be ingested into the system as and when required.

**29. Ability to customize configurations based on preferred workflow using specific fields and values such as: project names, client names, client types, engagement numbers, engagement types, reporting periods, and report issue dates**

The SAS Solution workflow engine allows for customizable and dynamic workflow to be defined that is based on any number and combination of field values, allowing for a high level of configurability as shown in Figure 18. The workflow engine allows audits to pass through various required tasks with the routing of those tasks being dynamic based on configurable workflow rules. The workflow definitions themselves are configured directly within the Solution using a drag and drop workflow configuration tool. All workflow tasks have easily configurable due dates and escalation periods that can be set based on reporting periods or any other temporal based value.



*Figure 18. The SAS Solution's workflow is dynamic and customizable based on SAO's needs.*

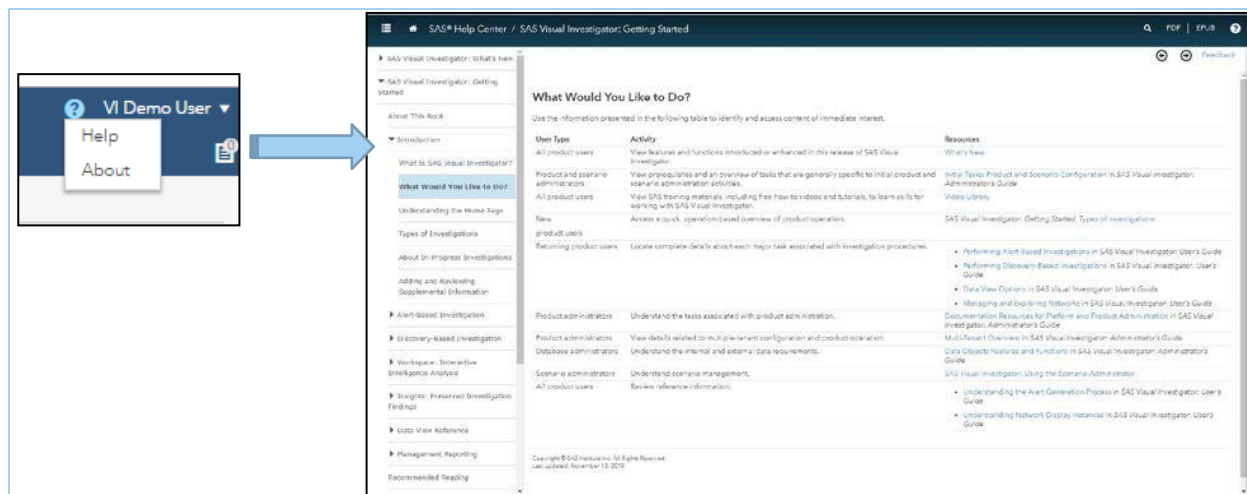


**30. Policy and Terminology Configuration Management: structured hierarchy; provides for configuration updates that associate all data with the assigned configuration item. All data auto-populates based on administrative configuration.**

The SAS Solution supports structured hierarchies that separate display labels from underlying values and allows administrators to change the displayed label if required while leaving the underlying value intact. The auto population of data is controlled at an administrative level if and when required.

**31. Online tutorial and offline manual and help functions**

The SAS solution provides a robust online help capability that is accessible from the user interface and provides detailed instructions on the use of core functions and capabilities as shown in Figure 19. The SAS Help Center information is maintained by SAS and is updated as new capabilities and functions are added to the platform. The SAS solution can also display a separate link to a help resource which would be created and maintained by SAO.



**Figure 19. The SAS Solution's help functionality.**

The SAS Solution comes with an in-depth user manual for both users and administrators covering all of the functions of the software. The SAS System Training team covers a broad spectrum of customer training services as well as the SAS Certified Professional Program. Training is available in multiple delivery methods:

- ◆ Live Web classroom training. Courses taught by SAS instructors in real-time over the Web to your desktop.
- ◆ e-Learning. Innovative and engaging self-study available online, when you need it and where you need it. For more details about the e-Learning offered please visit [https://www.sas.com/en\\_us/learn/academic\\_programs/resources/free-sas-e-learning.html](https://www.sas.com/en_us/learn/academic_programs/resources/free-sas-e-learning.html)

Many SAS customers desire “User Guides” for their custom configuration of the Solution. These guides for SAO can be provided electronically and in print and they detail “step-by-step” instructions for users to follow to use the application. Instructions can be crafted showing users how to complete a workflow, an audit, and all associated tasks. These user guides are developed during the solution delivery phase of the project and delivered to SAO upon the completion and acceptance of the final configuration and workflows.



Outside of direct training sessions with the SAS Training team, online tutorials are available through both formal documentation and crowd-sourced support through the SAS Support Communities. The Support Community is a place for users to find resources and share their knowledge. The SAS Community Library contains articles which go into great depth about a specific topic. These online and offline print manuals contain code samples, output, screen shots, and step-by-step instructions for supporting solution administration and architecture.

*32. System Training to cover administrative needs and availability during regular business hours to support product issues*

Our consultants provide SAO's technical and administrative staff with hands-on experience and knowledge transfer during implementation to ensure an easy transition into operations. The SAS team will develop knowledge transfer plans, with content and schedules. We will train your IT and administrative/managerial staff to operate and support the SAS solution to ensure they understand all the processes for successful operation.

SAS provides unparalleled, award-winning technical support 24 hours a day, 7 days a week via telephone, e-mail, or the SAS support site (support.sas.com). Telephone support is provided during regular business hours to support product issues. For critical problems after normal support hours, callers are directed to one of our world-wide support centers providing 24-hour "follow the sun" support. SAS maintenance support includes updates to software and documentation; software patches and bug fixes; help with system configuration problems, end-user problems, and help with other aspects of using the proposed software system. SAS Consulting can be engaged, as needed, to provide professional assessment for hardware and software impacts.

*33. Expandability and integration support for new technologies (i.e. follows software development best practices and has an active development plan / business plan that will ensure continued compatibility and integration with new technologies)*

The SAS Solution offers a number of integration points that allows new technologies to be integrated into the platform. These integration points vary in their level of sophistication including:

- ◆ Solutions extensions – provide maximum a level of configurability and extensibility, allowing new visual components to the user interface for the SAS Solution to be created using a published API. These solution extensions vary from creating a new data entry component all the way up to sophisticated integrations with 3<sup>rd</sup> party data and custom user interfaces.
- ◆ Plugins – available for various components within the SAS Solution allowing custom capability to be added to already existing components. One frequently used plugin service is the Subscription Lookup function which provides the building blocks for search and retrieval of 3<sup>rd</sup> API data while allowing the plugin developer to focus on the specifics of that API.

The SAS Solution is developed by a large team of software professionals to the very latest standards in software engineering. SAS continues to deliver new capabilities to ensure continued compatibility with new and emerging technologies to support our large and varied worldwide customer base.

*34. Vendor offers enterprise level product and/or service*

The SAS Solution is an enterprise level product. The Solution would be operational across the SAO enterprise on day 1.



**Technical hardware and software system requirements for operating systems, web servers, and database servers.**

The SAS Enterprise Excellence Center can provide SAO with a hardware sizing expertise and an official hardware recommendation that is based on SAO's deployment type, the estimated SAS workload, and 350 users. Typically, SAS recommends multiple machines for improved performance. The SAS client is web based and operates on Windows 10 through either the Microsoft Edge or Chrome Browsers. Windows 10 is the main desktop operating system on which the solution is tested and used and, as such, will continue to be supported through future patch releases and updates. The server infrastructure runs on the Linux operating system, either SUSE or RedHat, and utilizes the PostgreSQL 11 database for storing data and metadata. The system is architected using a microservices based architecture which allows for flexibility, scalability and ease of upgrade. The Solution is entirely browser based with all user and administrative functions performed through a web interface without the need to install any desktop client software. The software can be architected in a variety of configurations depending on the needs of the organization, number of required users and estimated data sizes. The Solution can be installed on premises or hosted in the cloud.

**Vendors are encouraged to provide sample per-user and tiered pricing for annual operating and maintenance fees, system upgrades, licensing fees, technical support or training, and equipment offered in their response.**

The SAS solution is not priced per user. The following table shows an estimate of pricing for the SAS Solution:

<b>Office of the Washington State Auditor (SAO)</b>		
<b>Hosted - Pricing Estimate</b>		
<b>Software license</b>		
<b>350 users and 16 cores</b>		
SAS Solution	\$435,000 – \$840,000	Includes Software and Hosting fees
<b>Implementation</b>		
Implementation	\$175,000 – \$350,000	Service Hours
<b>Training</b>		
Training	\$25,000 – \$50,000	SAS Training Credits (Optional)
<b>Total Estimated First Year Fee</b>	<b>\$635,000 - \$1,240,000</b>	

**Optional Software Maintenance and Hosting Fees**

Year 2 (Optional)      \$365,000 - \$390,000

Year 3 (Optional)      \$370,000 - \$395,000

**Note:** As SAS is committed to being vendor agnostic and is not a reseller of hardware and clarifies that it is not offering the sale of any hardware in connection with this response.

**Vendors should be able to provide a product presentation to demonstrate functions, features, and how their software can meet or exceed these requirements**

SAS welcomes the opportunity to demonstrate the value of our solution to SAO. As part of that discussion, we will work with you to further flesh out requirements so that we may provide a more robust cost estimate.



## Corporate Overview

Headquartered in Cary, North Carolina, SAS is the largest privately held software company in the world with annual revenue of over \$3.25 billion – and continues to invest an unparalleled 26% of revenue back into R&D. We have been in business for nearly 45 years and our longevity is a testament to our superior software and customer service. Our mission is to deliver superior software and services that give people the power to make the right decisions.

As the leader in business analytics, SAS helps organizations understand their business drivers and create answers to complex problems. SAS eliminates the complexity of sharing data and applications across the organization. SAS goes beyond other vendors' narrow definitions of business intelligence, offering business analytics – data management and predictive analytic capabilities that tell an organization not just where it has been, but where it should go next. SAS business analytics deliver the foresight and understanding that is required to meet and exceed goals.

Founded in 1976, SAS serves more than 83,000 government, university, and business sites in 147 countries. SAS solutions are used extensively by all 50 state governments, all 15 federal departments and approximately eighty-five percent (85%) of federal sub-agencies and quasi-governmental affiliates. Ninety-one (91) of the top 100 companies on the 2019 Fortune 500® list rely on SAS.

For four decades, SAS has delivered the latest technology to our government customers, taking their operations to new levels. Our U.S. state and local government practice helps state government agencies meet their missions and goals faster and more accurately than ever before. We want to be the most valued partner in government decision making.

Analysts rank SAS  
as a leader in:



AI-Based  
Text Analytics



Machine  
Learning



Analytics



Customer  
Analytics



Fraud  
Detection



Risk  
Management



Data  
Integration



Data  
Quality



Big Data



Enterprise  
Insights Platform

