pGc Paul Garstki Consulting

# INDEPENDENT REVIEW

## OF A PROPOSED

# INTEGRATED WORKPLACE MANAGEMENT SYSTEM PROJECT

***For the***
***STATE OF VERMONT***
***AGENCY OF DIGITAL SERVICES (ADS)***
***And***
***AGENCY OF ADMINISTRATION,***
***BUILDINGS AND GENERAL SERVICES (BGS)***

***Submitted to the***
***State of Vermont, Office of the CIO***
***by:***

Paul E. Garstki, JD, Consultant
d/b/a/ Paul Garstki Consulting
344 Laird Pond Rd.
Plainfield, VT 05667
***paulg.consulting@gmail.com***

**October 5, 2020**

Version 3.1a

TABLE OF CONTENTS

## TABLES

# 1 EXECUTIVE SUMMARY

*Provide an introduction that includes a brief overview of the technology project and selected vendor(s) as well as any significant findings or conclusions. Ensure any significant findings or conclusions are supported by data in the report.*

The Agency of Administration (AOA) Department of Buildings and General Services (BGS) exists primarily to provide the facilities and services required for all state agencies and departments to accomplish their missions. BGS is responsible for most of the State's own building construction and renovation, buildings and grounds maintenance and custodial services, and leasing of State properties. (The Agency of Transportation [AOT] maintains buildings and properties related to transportation.)

Currently, the 300+ staff of BGS employ a variety of "manual" processes – including spreadsheets, phone calls, emails, a standalone database for work orders, and desktop productivity applications – to conduct the processes described above. The various units within BGS each have their own "manual" processes, and much of the data contained within is not automatically coordinated with or accessible by other units, leading to various inefficiencies and obstacles to productivity. For example, senior staff regularly spend significant meeting time orally exchanging information about these activities.

The State seeks to modernize and improve these processes by acquiring a databased Integrated Work Management System (IWMS) for all aspects of facilities management. The selected vendor, AssetWorks, a 29-year-old corporation with headquarters in Pennsylvania, provides an integrated Software-as-a-Service (SaaS) solution covering all BGS facilities management needs in a securely hosted solution called AiM. The AiM solution is modular, and the modules selected for the proposed project are:

- AiM Assessment & Needs Analysis (ANA)
- AiM Capital Planning & Project Management Module (CPPM)
- AiM Lease Management
- AiM Operation & Maintenance Module (O&M)
- ReADY Request
- AiM Space Management
- ReADY Space

BGS states that it expects to achieve the following improvements by implementing this system:[1]

**REPORTING:** Centralizing all facilities data in one system will make it possible to provide information that is real-time, up-to-date, and accurate. IWMS provides the tools necessary to review the full lifecycle and associated costs of an asset and allows BGS to present decisions with actionable data to the legislature, customers and throughout the organization. This system will ultimately replace the annual

[1] State of Vermont, *IT Activity Busines Case & Cost Analysis (IT ABC Form), Integrated Workplace Management System*, Final approval Dec.05, 2019.

publication of the "Space Book" with live data and reporting. It will also dramatically reduce the staff time required to respond to legislative queries and other unplanned reporting.

**PROCESS IMPROVEMENT:** BGS will see an improvement in streamlining facility processes, improving customer service and reducing costs. Data gathered by front line employees at the component level will provide more accurate accounting of periodic maintenance, allow updated life cycle estimates and feed long-range planning with comprehensive data analysis.

**CUT RESOURCE COST:** When State officials and management have better visibility into occupancy data from an IWMS, they can make informed decisions about the space portfolio. This will assist in dollar in/dollar out reconciliation. The current $12million deficit due to our inability to reconcile lease payments cannot be addressed effectively until this system is in place. Questions about renewing leases, decreasing the property inventory or whether or not to construct a new building are costly issues–but discussions are easier with real-time, accurate data stored in reliable hosted enterprise software platform.

## 1.1 COST SUMMARY

**Table 1 - Cost Summary**

| | |
|---|---|
| **IT Activity Lifecycle (years):** | **5** |
| **Total Lifecycle Costs:** | **$ 2,266,745.83** |
| **Total Implementation Costs:** | **$ 1,931,933.83** |
| **New Average Annual Operating Costs:** | **$ 66,962.40** |
| **Current Annual Operating Costs** | **$ 245,229.00** |
| **Difference Between Current and New Operating Costs:** | **$ (178,266.60)** |
| **Funding Source(s) and Percentage Breakdown if Multiple Sources:** | **State** |

## 1.2 DISPOSITION OF INDEPENDENT REVIEW DELIVERABLES

Table 2 - Disposition of Independent Review Deliverables

| Deliverable | Highlights from the Review<br>*Include explanations of any significant concerns* |
|---|---|
| **Acquisition Cost Assessment** | The total acquisition cost of this project, exclusive of annual ongoing Operations & Maintenance costs, is **$ 1,931,933.83.** This includes internal State personnel costs and vendor implementation costs.<br><br>The current vendor SOW presented offers a Time & Materials (T&M) contract. We think this presents some risk to the State, as costs could potentially exceed estimates. The State is potentially pursuing a Firm Fixed Price (FFP) contract instead, although this is not yet settled. This might result in a cost higher than the T&M estimate but would remove uncertainty. We support this approach.<br><br>The current economic situation, especially in light of the covid-19 pandemic, means that funding is necessarily tentative. However, there is very strong support for the project at the highest levels of the Agency of Administration, the project potentially will provide significant cost and productivity savings for the State. |
| **Technology Architecture Review** | This pure Software-as-a-Service (SaaS) solution aligns well with the State's architectural preferences in all reviewed aspects.<br><br>We were initially concerned that, because of the Sole Source nature of the proposed contract, many Non-function Requirements (NFRs) normally put forth in an RFP were not addressed by the vendor (because they were not requested). This created a problem for both Independent Reviewer and State in determining alignment with State architectural requirements and preferences, including security requirements. The State has addressed this risk by assembling a list of relevant un-addressed NFRs to the vendor, and the vendor has addressed them fully. |
| **Implementation Plan Assessment** | The implementation plan proposed by the vendor is modular in nature, highly detailed, and looks to be realistic and likely of success in the proposed 18-month timeframe. We are satisfied with the vendor's experience and approach, including their extensive attention to communication with the State-side project team.<br><br>We found a high degree of enthusiasm for the project, especially at senior management levels of BGS. We saw potential risks in these areas:<br>• The need for organizational change management, to ensure successful adoption of the solution at all levels of BGS operations, and to avoid reliance on deprecated manual processes. |

- The need for an active and monitored communication platform to engage BGS employees and inform them of the goals and progress of the project, and the timing of module implementations.
- Small project team on a project that will require significant State personnel time

We are satisfied with the State's proposed mitigations in all the above areas.

**Cost Analysis and Model for Benefit Analysis**

**Tangible benefits**

- Savings over 5-year project lifecycle of retiring existing work order system after proposed project implementation: $226, 145
- Savings over 5-year project lifecycle of forgoing outsourced annual facility condition assessment: (up to) $1,000,000

| | |
|---|---|
| **Total projected tangible benefits:** | **$ 1,026,145.00** |
| **Total projected costs (project lifecycle:** | $ 2,266,745.83 |
| **Total Tangible Benefit (Cost Savings)** | $(1,240,600.83) |

**Intangible Benefits**

The intangible benefits are not only significant, but important for the State to achieve its goals of process improvements leading to cost avoidance and cost savings at BGS, in areas such as lease renewal negotiation, deferred maintenance, non-duplication of work, sequencing of work, and other important areas. We would expect significant eventual cost savings; however, these may only be determined ex post facto, and attributing them directly to this project would probably be based on anecdotal evidence.

**Impact Analysis on Net Operating Costs**

**Cumulative Cost Savings over lifecycle of project compared to current costs = ($795,372)**

There is no "breakeven point" during the project lifecycle because implementation costs are significant.

However, if hypothetical current costs remained the same, then we could project a breakeven around 10 years out. With the same exercise, if not counting internal SOV personnel costs, then there is breakeven around 7 years.

| | |
|---|---|
| **Analysis of Alternatives** | We considered 3 different models of development/deployment (in-house), vendor provided, and vendor-supported, and concluded that g***iven Vermont's IT Strategic Principles and goals, and its Enterprise Architectural Guiding Principles, the second approach (Third Party Vendor Solution) is clearly appropriate.***<br><br>We considered architectural alternatives, including:<br>• Continue manual methods<br>• In-house solution<br>• Integration/cooperation with AOT VAMIS solution<br><br>We concluded that the State's proposed approach, employing an SaaS IWMS, is the only truly feasible solution. |
| **Security Assessment** | As described in section 6, Technology Architecture Assessment, the sole-source contract procurement process for this project resulted in a situation where many Non-functional Requirements (NFRs) normally transmitted to the vendor in the RFP process, were not addressed by the GSA SOW. Consequently, we at first, in consultation with the ADS Security Division, found it impossible to address many aspects of the security-related questions specifically required for this review. This is not to say that the vendor is deficient or incapable of meeting requirements of security, recovery, breach notification, etc., that the State normally requires; indeed, the vendor's record with other governmental entities implies they are well-versed in these aspects. Rather, that they had not been specifically asked to address these requirements.<br><br>This risk has been mitigated since that time by the State's request to the vendor, as described in Section 6, above. We now have sufficient information to confidently assess the proposed solution's security stance as meeting or exceeding State requirements. |

## 1.3 IDENTIFIED HIGH IMPACT &/OR HIGH LIKELIHOOD OF OCCURRENCE RISKS

NOTE: Throughout the narrative text of this document, **Risks and Issues are identified by bold red text**, and an accompanying tag (**_RISK_ID# _0_** ) provides the Risk or Issue ID to reference the risk, response, and reference in the Risk Register.

The following table lists the risks identified as having high impact and/or high likelihood (probability) of occurrence.

Please see the **Risk & Issues Register, in Section 10**, for details.

**Table 3 - Identified High Impact & High Likelihood of Occurrence Risks**

| Risk Description | RATING IMPACT/ PROB | State's Planned Risk Response | Reviewer's Assessment of Planned Response |
|---|---|---|---|
| Availability of funding is uncertain, primarily due to budget constraints that may arise due to the pandemic | **50 5/10** | BGS has met with finance and we have multiple ways the project can be funded. There is a strong commitment from leadership including the project is relevant to COVID 19 response. | **concur** |
| There is a great deal of enthusiasm for the project, but nonetheless organizational change could be daunting, and could impact both the implementation and adoption processes. | **50 5/10** | Rather than a single person assigned to leading change for BGS, we will be using a decentralized change agent model which is a better fit for this project as each module is unique to a business function of the five divisions that maintain our portfolio of state facilities. With this approach, we will be leveraging multiple change agents in each division. | **concur** |
| Vendor's proposal is a Time & Materials offer. The vendor has indicated several areas where costs could rise if their estimate of State needs, requirements, or capacity is exceeded. | **50 5/10** | BGS will negotiate a Firm Fixed Price offer with vendor; this might increase final cost but would help in securing funding at project outset | **concur** |

| | | | |
|---|---|---|---|
| There is currently no communication model or platform for informing and preparing potential users of the system about project features, benefits, timeline for implementation, or progress status. | **35**<br>**5/7** | BGS has an existing SharePoint site for this project. We will also communicate through all company meetings, smaller team meetings and regular email and newsletter style communications. | **concur** |
| BGS is currently administered by an Acting Commissioner who strongly supports this project. The appointment of a Commissioner could hypothetically bring to the top of the organization a person who does not feel as strongly enthusiastic about this project. Similarly, the Deputy Secretary of Administration, to whom the BGS Acting Commissioner reports, is retiring imminently, and hypothetically could be replaced by a less enthusiastic individual. Full support at the top executive level is crucial to the success of the project and to securing funding. | **30**<br>**3/10** | The Secretary of the Agency of Administration is supportive of this project. The Acting Commissioner was appointed from the Deputy Commissioner position (which remains open) and would be likely to continue as Deputy Commissioner with the appointment of a Commissioner, continuing her strong support for the project. The existing Directors are united and consistent in their enthusiasm for the project. This high level of support across the executive level would be likely to positively inform a new Commissioner's support of the project. | |

## 1.4 OTHER KEY ISSUES

none

## 1.5 RECOMMENDATION

**We recommend this project go forward as planned.**

## 1.6 INDEPENDENT REVIEWER CERTIFICATION

**I certify that this Independent Review Report is an independent and unbiased assessment of the proposed solution's acquisition costs, technical architecture, implementation plan, cost-benefit analysis, and impact on net operating costs, based on the information made available to me by the State.**

E-SIGNED by Paul Garstki
on 2020-10-29 19:01:33 GMT

_____ _____

**Independent Reviewer Signature** **Date**

## 1.7 REPORT ACCEPTANCE

The electronic signature below represent the acceptance of this document as the final completed Independent Review Report.

E-SIGNED by Morgan Amell
on 2020-10-29 20:31:51 GMT

_____ _____

**ADS Oversight Project Manager** **Date**

E-SIGNED by John Quinn
on 2020-10-30 19:43:40 GMT

_____ _____

**State of Vermont Chief Information Officer** **Date**

# 2 SCOPE OF THIS INDEPENDENT REVIEW

## 2.1 IN-SCOPE

The scope of this document is fulfilling the requirements of Vermont Statute, Title 3, Chapter 056, §3303(d):

### 2.1.1 THE AGENCY SHALL OBTAIN INDEPENDENT EXPERT REVIEW OF ANY NEW INFORMATION TECHNOLOGY PROJECTS WITH A TOTAL COST OF $1,000,000.00 OR GREATER OR WHEN REQUIRED BY THE CHIEF INFORMATION OFFICER

### 2.1.2 THE INDEPENDENT REVIEW REPORT INCLUDES:

A. An acquisition cost assessment;
B. A technology architecture and standards review;
C. An implementation plan assessment;
D. A cost analysis and model for benefit analysis;
E. An analysis of alternatives;
F. An impact analysis on net operating costs for the Agency carrying out the activity; and
G. A security assessment.

## 2.2 OUT-OF-SCOPE

- A separate deliverable contracted as part of this Independent Review may be procurement negotiation advisory services, but documentation related to those services are not part of this report.

# 3 SOURCES OF INFORMATION

## 3.1 INDEPENDENT REVIEW PARTICIPANTS

Table 4 - Independent Review Participants

| First | Last | Title | Role | Topic |
|---|---|---|---|---|
| Jennifer | Fitch | Deputy Commissioner, BGS | Project Sponsor | Overview, history, benefits |
| Erik | Filkorn | Principal Assistant, BGS | Business Lead | Overview, history, benefits |
| Melissa | Prindiville | Facilities Asset Analyst, BGS | Business Lead / SME | Process improvements, benefits |
| Morgan | Amell | IT Portfolio Manager, EPMO, ADS | IT Portfolio Manager, IR Point of Contact (POC) | Project history, organization |
| Miranda | Davison | IT Project Manager, EPMO, ADS | Project Manager, IR POC | Project Management |
| John | Hunt | Enterprise Architect, Chief Technology Office, ADS | Enterprise Architect | Enterprise Architecture |
| Marc | McClanahan | IT Lead for AOA, ADS | IT Lead | Information Technology |
| Warren | Harris | Security Analyst, CISO Office, ADS | IT Security Analyst | Security and Privacy |
| Michael | Blanchard | Business Analyst, EPMO, ADS | IT Business Analyst | Business processes |
| Stephen | Fazekas | Technology Procurement Administrator, Vermont Office of Purchasing and Contracting (OPC) | Procurement | Sole Source Procurement process |
| E. Amy | Benson | Director, Integrated Asset Services Division Department of General Services, City of Los Angeles | External reference | Vendor Information |
| Steve | Peary | Assistant Director for Technology, Innovation, and Administration, Physical Plant Department, University of Vermont | External reference, on behalf of Univ. of Main | Vendor Information |

## 3.2 INDEPENDENT REVIEW DOCUMENTATION

The following documents were used in the process and preparation of this Independent Review

Table 5 - Independent Review Documents

| Document | Source |
|---|---|
| **IWMS Integrations** | VT ADS, Enterprise Architecture |
| **IWMS User Stories from SOW V.2** | AssetWorks |
| **IWMS User Stories Not From AW** | VT, AOA BGS |
| **IT_ABC_Form_BGS_IWMS_APPROVED_12.05.19** | VT ADS, AOA BGS |
| **IWMS Context & Flow Diagrams V9 SOW** | VT ADS, AOA BGS |
| **Hosting _Exhibit AW_State of Vermont_12June2020** | AssetWorks |
| **IWMS core team members** | VT ADS |
| **Building Assets** | VT ADS, Enterprise Architecture |
| **SOV_Price Proposal & SOW v3_061820** | AssetWorks |
| **draft_Project Charter BGS IWMS** | VT ADS, AOA BGS |
| **ATTACHMENT.D.SYSTEM IMPLEMENTATION.03.08.19FINAL** | AOA |
| **TEC - REVIEWED Hosting_Security Response Form Assetworks_08.17.20** | AssetWorks |
| **TEC - REVIEWED Hosting_Security Response Form Assetworks_08.17.20** | VT ADS, Enterprise Architecture |

| | |
|---|---|
| **AssetWorks LLC Sole Source Sign MWS.pdf** | VT BGS Contracting and Procurement |
| **Projects Consistently Exceeded Cost and Schedule Estimates; BGS' Process Weaknesses Hinder Its Ability to Improve Capital Project Management** | Report of the Vermont State Auditor |

# 4 PROJECT INFORMATION

## 4.1 HISTORICAL BACKGROUND

The senior staff of BGS have long been aware of the shortcomings and limitations of the manual processes employed to manage facilities. (In facilities management terminology, these facilities are often referred to as "vertical assets," meaning buildings, but also including parking lots, grounds, and other related facilities, both indoor and outdoor, spaces – such as office space – leased to other entities, etc.) In 2017, a report by the Vermont State Auditor, while referring particularly to capital projects, found limitations with many of these same processes.[2] At least 2-1/2 years ago, BGS began investigating possible technological solutions to serve their business needs in this regard, and at that time surveyed several potential vendors, including the presently selected vendor (AssetWorks) as well as its primary competitors.

During this information gathering process, the Agency of Digital Services (ADS) made BGS aware that AOT was in the process of implementing a related solution, the Vermont Asset Management Information System (VAMIS), and suggested that BGS might partner with this effort to meet its business needs. Some time was spent exploring this possibility, and ADS Chief Technology Office was engaged to assist in evaluating the prospects. In the end, it was determined that VAMIS was specifically suited to transportation-related assets, and that modifying it to accommodate BGS business needs would require the VAMIS vendor to develop new capabilities "from the ground up." The resulting recommendation was that BGS should pursue its own IWMS system, that the BGS system should interface with VAMIS so that vertical asset data could be shared, and that the BGS IWMS should be the "Single Sole Source of Truth for All State of Vermont Buildings."[3]

Having already surveyed the IWMS vendor landscape, including Vermont Information Consortium (VIC), in August of 2019 BGS determined that AssetWorks IWMS was the best available solution. Commissioner of BGS Christopher Cole in September, 2019, with the support of ADS and following the recommendation of the Office of Purchasing and Contracting (OPC) , requested that the Secretary of the Agency of Administration, Susanne Young, approve a sole source contract with AssetWorks, pursuant to Bulletin 3.5, and allowable under 29 V.S.A. §903a, "piggybacking" off General Services Administration (GSA) contract #GS-35F-317GA. This request was approved and led to the present proposed project.

[2] Vermont State Auditor, *Projects Consistently Exceeded Cost and Schedule Estimates; BGS' Process Weaknesses Hinder Its Ability to Improve Capital Project Management*, June 16, 2017.

[3] ADS Chief Technology Office, *Building Assets.pdf*, final version June 25,2020

## 4.2 PROJECT GOAL

- More robust reporting requirements for major maintenance and deferred maintenance to meet legislative reporting requirements.
- Improve work order processing which include move requests, opening, closing and moving tickets.
- Identify trends to allow for timing larger investments.
- Reduce staff time.
- Asset maintenance tracking.
- Process Improvement
- Managing maintenance work.
- Protecting and maintaining physical assets.

## 4.3 PROJECT SCOPE

### 4.3.1 IN-SCOPE

- Single Sign On
- Mobile APP
- Integrations with the State of Vermont Financial System (VISION), VAMIS, and potentially eProcurement (Ivalua system, now being implemented).
    - Shared data module with VAMIS
    - AssetWORKS system of record for all vertical assets for the state

### 4.3.2 OUT-OF-SCOPE

- Fleet and Fuel Management
- Surplus Asset Management
- Refinement of BGS business processes to align with system implementation
- Custom Reports

### 4.3.3 MAJOR DELIVERABLES

**Table 6 - Major Deliverables**

| Deliverable | comments |
|---|---|
| **Project Kickoff** | |
| **AiM Assessment & Needs Analysis (ANA)** | |
| **AiM Capital Planning & Project Management Module (CPPM)** | |
| **AiM Lease Management Module** | |
| **AiM Operation & Maintenance Module (O&M)** | |

| | |
|---|---|
| **ReADY Request** | • Includes 20 ReADY Request Templates. |
| **AiM Space Management** | • Ready Space & Property Space<br>• AiMCAD<br>• Spacesync |
| **Go Mobile Applications** | |
| **Go Live** | |

## 4.4 PROJECT PHASES, MILESTONES, AND SCHEDULE

**Table 7 - Project Milestones**

| Task Name | Date Completed* | Deliverable(s) Completed |
|---|---|---|
| **Project Planning** | 10/1/2020 | • Project Kickoff meeting<br>• Project Definition<br>• Implementation Schedule |
| **Milestone 1** | 12/8/2020 | • AiM Space & Property Space<br>• ReADY Request<br>• AiMCAD<br>• Spacesync |
| **Milestone 2** | 3/8/2021 | • AiM Assessment & Needs Analysis (ANA)<br>• AiM Capital Planning & Project Management Module (CPPM) |
| **Milestone 3** | 6/8/2021 | • AiM Lease Management Implementation Module<br>• AiM Operation & Maintenance Module (O&M) |
| **Milestone 4** | 10/8/2021 | • Go Mobile Applications<br>• Go Live |
| **Project Conclusion** | 1/15/2022 | • Documentation<br>• Training<br>• Project Close out. |

*The dates shown here are derived from the most recent draft Project Charter. They will likely shift somewhat depending on the timing of project approval, contract execution, and other similar factors. Given that uncertainty, the overall schedule represents the likely timing of project milestones.

# 5 ACQUISITION COST ASSESSMENT

Table 8 - Acquisition Costs

| Acquisition Costs | Cost | Comments |
|---|---|---|
| **Hardware Costs** | **$ 0.00** | No hardware costs to State |
| **Software Costs** | **$ 691,492.87** | Software licensing; does not include annual O&M cost |
| **Implementation Services** | **$ 778,873.96** | Provided by vendor and vendor's subcontractors |
| **State Personnel** | **$ 443,798.00** | See attach. 3, Cost Spreadsheet |
| **Professional Services (e.g. Project Management, Technical, Training, Independent Review etc.)** | **$ 17,769.00** | provided by IR consultant |
| **Total Acquisition Costs** | **$ 1,931,933.83** | |

## 5.1 COST VALIDATION:

*Describe how you validated the Acquisition Costs.*

Vendor implementation were derived from the Statement of Work (SOW) presented by the vendor, which constitutes the offer for this project.

State personnel costs were established from past and projected ADS personnel (Enterprise Architect, Project Manager, Security Analyst, Business Process Analyst) for the implementation of the project.

BGS personnel costs are established from BGS internal estimates of the costs of internal personnel time dedicated to the project only, over the project implementation phase.

**The vendor's SOW proposes a Time & Materials (T&M) contract, which implies that the final cost could vary, depending upon a number of factors identified by the vendor within the SOW. This is unusual for large State implementations of this sort, where the State usually prefers a Firm Fixed Price**

**(FFP) contract. We have identified the T&M nature of this offer as both a negative risk (_RISK_ID# _R5_) and a positive risk (_RISK_ID# _R8_). The negative risk eventuates if actions or decisions by the State result in higher costs before implementation is complete. This could imperil the project if increase funding is not available at that time. The positive risk eventuates if the T&M contract results in a project with lower cost. (Our contact with another State indicated that a similar project with the same vendor resulted there in a cost savings of around $200,000).**

**The positive risk could be *enhanced* by carefully tracking aspects of the implementation where savings are possible and encouraging that outcome. The negative risk might be addressed by *accepting* it, or more likely, by seeking to *mitigate* or *obviate* it buy pursuing a FFP contract with the vendor. This runs the risk of a possibly higher bottom line compared to the T&M offer, but helps to secure funding for the project, which is especially important in these uncertain times.**

**The State has chosen the latter path, and we concur that, on balance, this is the best approach. Any upside to this T&M offer is likely very much smaller than a possible downside.**

## 5.2 COST COMPARISON:

*How do the above Acquisition Costs compare with others who have purchased similar solutions (i.e., is the State paying more, less or about the same)?*

Because this vendor's SOW and offer originates from a General Services Administration (GSA) schedule, it would effectively ensure that the costs scale appropriately to the needs and scale of the purchaser, so any other state customer using the GSA route would have very comparable costs.

The University of Maine, in a similar implementation with the same vendor, had an approximately $2.2 million contract, and final costs were about $1.97 million. This puts their costs in a very comparable position to the present offer.

## 5.3 COST ASSESSMENT:

*Are the Acquisition Costs valid and appropriate in your professional opinion? List any concerns or issues with the costs.*

Yes, this seems like a well-documented offer. The vendor has the necessary resources and experience. Other customers have had in general very satisfactory experiences with this vendor. The benefits of the project (See Section 8, Cost Analysis and Model for Benefit Analysis, *below*) justify the cost.

**Additional Comments on Acquisition Costs:**

***None***

# 6 TECHNOLOGY ARCHITECTURE REVIEW

The proposed solution is a pure Software-as-a-Service (SaaS) application, hosted in a very secure hosting environment (Amazon Web Services – government level). State users (and external users, if any) will access the solution via common web browser environments. Role-based user authentication is native to the system, and there are various platforms available for authentication, so that the State is able to employ its preferential methods. The system cost is based on an initial implementation cost (see Section 7, Assessment of Implementation Plan, *below*) and ongoing annual Operation & Maintenance (O&M) cost is based on the number of user licenses needed. (One AssetWorks customer, the City of Los Angeles, reported to us that while their overall experience with the vendor was very positive, they did encounter some confusion about the number of user licenses needed. We identified this as a risk (**_RISK_ID# _R9_**), although a quite minor one, and recommended that the State request explicit user counting methodologies from the vendor, to avoid any unexpected cost increases. The State agrees with this mitigation strategy.)

In general, this is a strongly preferred model for solution deployment according to published SOV architectural principles.

The State's sole-source procurement process, which was to our view was followed rigorously and was appropriate for this project, nonetheless evolved a situation regarding architecture which was quite different from that produced by the usual Request For Proposals (RFP) process. In recent State RFP's for similarly large projects that this reviewer has seen, the State has both functional (business) requirements – which address the business functionality required by the State in a vendor's proposal – and Non-functional Requirements (NFRs) – which address requirements the State defines to fulfill architectural, IT, security, privacy, and statutory requirements – specific to the project being put out for bid, often developed by an ADS Enterprise Architect specifically for the project at hand. The bidder response form embedded in the RFP typically requires the bidding vendor to address each one of these requirements, explaining how the vendor will meet the requirement and how compliance will be demonstrated. These detailed responses allow the State – and the Independent Reviewer – to evaluate alignment of the proposed project with the State's architectural principles and preferences.

Because the offer for the presently proposed project began essentially with an SOW and price proposal from the vendor, the State did not initially receive this kind of detailed information. As a result, we were at that point not in a position to evaluate certain kinds of enterprise architectural features and processes especially regarding hosting and security and, in effect, neither was the State. We identified this as a risk (**_RISK_ID# _R4_**), discussing it with the project's project manager and Enterprise Architect. We recommended that the State mitigate this risk by requesting a detailed response from the vendor regarding relevant NFRs during the Independent Review process. The State's response was to do exactly that, and we judge that the response received from the vendor significantly improves the understanding by this reviewer and by the State of the vendor's compliance with these requirements, facilitating the assessments which follow in this section and in Section 11 – Security Assessment, *below*.

We hasten to add these important points:

- None of this assessment regarding requirements is to imply that the vendor is incapable or non-compliant. The State did not have a list of compliance with requirements from the vendor because the procurement process as it stood meant the vendor had not be asked for such a list. That situation is now rectified by the good work of the project's Enterprise Architect and Security Analyst, and the timely cooperation of the vendor.
- The project's ADS business analyst, through a process began well before the Independent Review, analyzed BGS business processes as they exist with current, "manual" processes, and as they will be if and when the proposed project materializes. We have reviewed this documentation. It is of excellent quality and crucial to successful configuration of the solution by the vendor. During that analysis, prior to the Independent Review, the business analyst did request and receive vendor responses to a number of important NFR's related especially to data, in the areas of Analytics, Audit, Collaboration, and Data Management.
- The State's standard contract language – ATTACHMENT D: INFORMATION TECHNOLOGY SYSTEM IMPLEMENTATION TERMS AND CONDITIONS (rev. 3/08/19) – contains a certain language that is equivalent to some NFRs, for example those terms regarding breach notification and data ownership. The vendor explicitly agreed to the terms of attachment D, and so some of those NFRs were addressed by agreement.

## 6.1 STATE'S ENTERPRISE ARCHITECTURE GUIDING PRINCIPLES

### 6.1.1 A. ASSESS HOW WELL THE TECHNOLOGY SOLUTION ALIGNS WITH THE BUSINESS DIRECTION

It aligns very well: The vendor's implementation process begins with the State's definitions of its business processes. The State has gone to great lengths to establish user cases – based on vendor-supplied cases as well as its own research – along with current (existing) business process analyses and to-be (i.e., desired in the new system) business process definitions. The vendor will use these to configure the various modules, and those in turn will be tested by the State and verified before final acceptance.

### 6.1.2 B. ASSESS HOW WELL THE TECHNOLOGY SOLUTION MAXIMIZES BENEFITS FOR THE STATE

Because of business process improvements, we expect the State to realize significant benefits in productivity, efficiency, and very likely cost savings (for example, in deferred maintenance decisions)

### 6.1.3 C. ASSESS HOW WELL THE INFORMATION ARCHITECTURE OF THE TECHNOLOGY SOLUTION ADHERES TO THE PRINCIPLE OF INFORMATION IS AN ASSET

The proposed solution is structured specifically to maximize the utility of information that the State collects, monitors, and applies to its benefit. The existing "manual" processes employed by BGS prior to this project were inefficient, sometimes redundant, disconnected, and "leaky"—i.e., because different repositories and users might use different instances of the same data, and those instances were not automatically synchronized (e.g., they might require manual synchronization), it was possible that data might be updated in one location and not in another, resulting in various inefficiencies. The proposed solution consolidates this information into a coherent, internally consistent whole.

### 6.1.4 D. ASSESS IF THE TECHNOLOGY SOLUTION WILL OPTIMIZE PROCESS

Business process optimization is the driving motivation for this entire project. As mentioned above, the technology consolidates and synchronizes the various data inputs that inform BGS decisions; and importantly, the same technology effectively automates communication between the various functional business units of the division. Where previously in-person meetings between respective directors constituted the forum for exchanging information, taking up valuable time and displacing more important decision-making, and using expensive personnel time – that communication is now automatic and implicit in the database technology. This frees these decision makers to attend to matters that require their expertise and judgment.

### 6.1.5 E. ASSESS HOW WELL THE TECHNOLOGY SOLUTION SUPPORTS RESILIENCE-DRIVEN SECURITY.

By consolidating disparate information into a single, interrelated database, the solution both greatly increases data resilience (see 6.1.3, above) which in turn eliminates an important vulnerability posed by the current "manual" processes, namely that with data existing in numerous forms in many different repositories (largely spreadsheets), it becomes nearly impossible to ensure that data corruption or tampering – whether accidental or intentional – cannot take place. The proposed system establishes a more effectively auditable and traceable information set.

## 6.2 SUSTAINABILITY

The proposed solution is a pure, Software-as-a-Service (SaaS) platform. Aside from web browser-equipped workstations and adequate network access, no additional hardware is required to operate the system for either State or other users. When any customer (e.g., a different state government) requests increased functionality in a module, other customers benefit from that improvement in a future release. The State is acquiring access to the vendor's API, allowing the State's resident software experts to develop new software data interfaces as needed. The vendor offers a clear "change order" path for new functionality requests, and other customers have reported to this reviewer that the process works well. Taken together, these characteristics ensure long-term sustainability, as the State has minimal capital investment and maximum flexibility should its needs change in the future.

## 6.3 HOW DOES THE SOLUTION COMPLY WITH THE ADS STRATEGIC GOALS ENUMERATED IN THE ADS STRATEGIC PLAN OF JANUARY 2020?

### 6.3.1 INCREASE AUTOMATION AND RELIABILITY OF THE SERVICES WE DELIVER TO VERMONTERS

The current processes employed by BGS are almost entirely manual, with data existing in separate, unrelated "silos." The objective of this project is to automate and relate all these disparate processes, increasing reliability and usability.

### 6.3.2 IMPROVED EXPERIENCE OF THEIR GOVERNMENT FOR VERMONTERS BY 2020

The benefits expected from this project in the areas of cost savings and productivity improvements will benefit Vermont citizens. The 2020 timeline is not applicable for this particular project.

### 6.3.3 CONTINUOUS, EFFECTIVE DEFENSE OF THE STATE'S INFORMATION NETWORK

An ADS Security Analyst was engaged through the procurement process of this project. Please see **Section 7 Security Assessment,** *below,* for further information about security and privacy in this project.

### 6.3.4 SUPPORT CREATION OF A COMPREHENSIVE EXECUTIVE BRANCH IT BUDGET WITH GREATER ACCURACY OF REPORTING BY 2021

This goal is not specifically addressed by the proposed project; however, by consolidation of information facilitated by this system, a more comprehensive and accurate understanding of costs and benefits of IT within BGS is implicit, especially as compared to the existing, disparate and dispersed "manual" systems, the costs of which are extremely difficult to quantify.

## 6.4 COMPLIANCE WITH THE SECTION 508 AMENDMENT TO THE REHABILITATION ACT OF 1973, AS AMENDED IN 1998

Vermont.gov has adopted Section 508 and W3C Web Accessibility Initiative standards and guidelines as the benchmark to meet the objectives of the Universal Accessibility for State Web sites policy. These published Section 508 guidelines where published to the federal register on December 21, 2000 and will be implemented in portals by June 21, 2001. The Access Board (the federal board assigned to create

Section 508 standards) used the W3C Web Accessibility Initiative guidelines as the benchmark for developing their standards.[4]

The vendor's proposal does not address section 508 or W3C Web Accessibility standard. It is typical that vendors providing web-based services to governments are familiar with these standards, and we expect that will be the case here. However, we do recommend that the State explicitly require these standards where appropriate through the contract negotiation process.

## 6.5 DISASTER RECOVERY

The application will be hosted in Amazon Web Services (AWS) data centers. The vendor uses AWS services to ensure that the application's data is frequently and fully backed up. The vendor states that "Full database and incremental file system backups are taken each night and stored at an offsite facility. Backup data is retained for 10 days." Elsewhere, the vendor states that "The system is automated to back-up regularly and multiple disaster recovery options are available."

The State EA and CISO offices consider AWS services to be robust and reliable. At the same time, we note that AWS offers several options for backup services. For example, the State's standard **Attachment D: Information Technology System Implementation Terms And Conditions** (rev. 3/08/19), to which the vendor explicitly agrees via the contract, states that "The Contractor shall maintain a fully redundant backup data center geographically separated from its main data center that maintains near realtime replication of data from the main data center. The Contractor's back-up policies shall be made available to the State upon request. "[5]

The standard backup option provided by the vendor as described may or may not fulfill the "near realtime" requirement. Consequently, we recommend that the State request the vendor to clarify exactly which AWS options are available, so that the State may be assured that its requirements in this area are maintained.

## 6.6 DATA RETENTION

Data is retained in the system indefinitely, or as long as the State requires it. The vendor has recommended a database size for Vermont based on its experience with other government customers. Additional storage is available at additional cost, should the State determine a need for it.

## 6.7 SERVICE LEVEL AGREEMENT

[4] https://www.vermont.gov/policies/accessibility, accessed January 14, 2020.

[5] State of Vermont, *Attachment D: Information Technology System Implementation Terms And Conditions (rev. 3/08/19),* pg. 7

### 6.7.1 WHAT ARE THE POST IMPLEMENTATION SERVICES AND SERVICE LEVELS REQUIRED BY THE STATE?

In the absence of an RFP, the State did not put forward a Service Level requirement in advance of the vendor's SOW; however, the SLA proposed by the vendor is described in the section below.

### 6.7.2 IS THE VENDOR PROPOSED SERVICE LEVEL AGREEMENT ADEQUATE TO MEET THOSE NEEDS IN YOUR JUDGMENT?

The vendor has provided to the State a sample of its standard "Service Levels and Remedies" (i.e., Service Level Agreement or SLA). We find this sample to be clear and adequate to meet the needs of the State.

In general terms, the SLA provides for an *average* of 95% availability over each calendar quarter, established by the following formula:[6]

*x = (y - z) / y * 100*

*Where,*

- *"x" is the Availability of the Application during the quarter;*
- *"y" is the total number of hours in such quarter minus the number of hours during such quarter that the Customer is unable to log into the Application because of (a) regularly scheduled maintenance windows for the Application and for times in which Customer has been notified in writing (including e-mail) by AssetWorks in advance thereof; (b) a Force Majeure Event; (c) non-performance of hardware, software, ISP connections, and other equipment that is not provided by AssetWorks or certified by AssetWorks for use in conjunction with the Services (except as such non-performance is directly or indirectly caused by AssetWorks).*
- *"z" is the number of hours in such month during which the Customer is unable to log into the Application (other than for reasons set forth in the definition of "y" above); provided that AssetWorks has been notified or is otherwise aware (or reasonably should be aware) of Customer's inability to utilize the Application.*

The metric is clear and reasonable.

In the event the average Availability for the Application is less than ninety five percent (95%) during any two consecutive quarters, Customer will receive a credit to its account with AssetWorks of five percent (5%) of the amount of a quarter's aggregate Services Fees paid or payable by Customer to AssetWorks. While not overly generous (in that it is limited to a 5% credit), it is at least clear, and most likely adequate as an incentive for the vendor to meet or exceed availability targets.

[6] AssetWorks, *Hosting Exhibit X to the Statement of Work*

## 6.8 SYSTEM INTEGRATION

### 6.8.1 IS THE DATA EXPORT REPORTING CAPABILITY OF THE PROPOSED SOLUTION CONSUMABLE BY THE STATE?

Yes, by means of both standard "built-in" reports, dashboards, data sources, and customizable reports as well as future interfaces developed by State developers.

The base product reports are available to all clients at each product release; in other words, if one client (e.g., another state government) requests the development of a new "built-in" report for the base product, then all other clients (such as State) will gain access to those new reports. The base product reports as have been seen by project personnel are useful and adequate to the State. However, at additional cost and through the vendor's change request process, the State can request new base product reports if and when they are needed.

As part of the SOW and eventual contract with the vendor, the State will be acquiring from the vendor technology to create interfaces with State systems, by means of application programming interfaces (APIs) and standard file formats that are used to view, access, insert, or manipulate the AiM database programmatically.

### 6.8.2 WHAT DATA IS EXCHANGED AND WHAT SYSTEMS (STATE AND NON-STATE) WILL THE SOLUTION INTEGRATE/INTERFACE WITH?

The State is anticipating several integrations between existing State systems and the proposed solution. Over time, other integrations may be advisable, but currently the following are planned or under serious consideration. We assess that between vendor and State there exist sufficient knowledge, developer resources, and technology tools to assure success.

| | |
|---|---|
| Active Directory | The SOV Single Sign-On (SSO) network. (Azure Public Cloud). Vendor provides this. (Any non-state users will have in-solution authentication) |
| ArcGIS | This is the connection to the building location information. |
| VAMIS | This is the connection to the Agency of Transportations's Vermont Asset Management Information System (VAMIS). SOV is considering various approaches, possibly using a single integration system as a target for both the IWMS vendor and the VAMIS vendor. |
| AutoCad | CAD file data sharing. SOV would arrange this, probably using file sharing. |
| VISION | The vendor provides flat files of relevant data for sharing with Enterprise Resource Planning (ERP) |

| | |
|---|---|
| | platforms such as vision. However, SOV is currently considering real-time integration using the vendor's APIs. |
| eProcurement | There are no immediate plans to integrate with eProcurement (Ivalua is the e-procurement Platform the State is implementing). The State may want to integrate in the future, as Assetworks and Ivalua can be integrated using the vendor's API. |

**Additional Comments on Architecture:**

***none***

# 7 ASSESSMENT OF IMPLEMENTATION PLAN

## BACKGROUND

The vendor proposes a modular implementation plan, first determining State business process needs in collaboration with the State, then agreeing on the necessary modular configuration. Core and common functionality is implemented first, and then modules are implemented in a stepwise fashion, each following a similar pattern of collaborative planning, sample data extraction, module configuration and delivery for test, testing by the State, revisions as necessary, migration of data, walkthrough, finalization, final acceptance of the module deliverable, and training.

**Table 9 - Vendor Deliverables**

| Deliverable | Timeframe |
|---|---|
| **AiM & AiM IQ - Application Installation** | 10 days |
| **ReADY Request - Application Installation** | 10 days (concurrent with above) |
| **AiM Space Management Implementation** | 96 days |
| **ReADY Space Implementation** | 50 days |
| **AiM O&M Implementation** | 155 days |
| **ReADY Request Implementation (up to 20 Templates)** | 70 days |
| **AiM CPPM Implementation** | 139 days |
| **AiM ANA Implementation** | 84 days |
| **AiM Lease Management Implementation** | 85 days |

The modular deliverables listed above closely parallel the State expected deliverables in Section 4.3.3, *above*.

The modular approach is consistent with State preference and capability, ensuring that limited State resources are not overextended by trying to do too much at once. The clarity and consistency of the vendor's approach will help to ensure that BGS and project management staff can manage the project from unit to unit, growing more familiar with the process over the implementation.

*After assessing the Implementation Plan, please comment on each of the following.*

## 7.1 THE REALITY OF THE IMPLEMENTATION TIMETABLE

The implementation period is 17 to 18 months. A review of the vendor's proposed timetable shows it to be well-structured, likely to succeed, and based upon their experiences with prior implementations.

## 7.2 READINESS OF IMPACTED DIVISIONS/ DEPARTMENTS TO PARTICIPATE IN THIS SOLUTION/PROJECT

*(consider current culture, staff buy-in, organizational changes needed, and leadership readiness).*

In general, we found enthusiasm in BGS offices to be quite high, with the highest levels in senior management – perhaps because they are most aware of the failings of the existing, largely "manual" systems. In field locations (i.e., in State locations/buildings around the State) informal surveying by BGS staff indicates a range of enthusiasm from very excited to indifferent. This seems to be related to the size of the facility: potential users in small locations find less need for an asset management system. All in all, however, we would not expect any significant objections.

We do find four areas where attention is needed:

- The proposed solution changes almost every way in which vertical asset management and related activities are conducted at BGS. Many of the systems in use are somewhat informal, quite idiosyncratic, and have probably been in use for years. This means there is a high possibility of users reverting to manual, deprecated processes after the new system in place – particularly in the case of an emergency or other stress on the system. We identified this as a risk (**_RISK_ID# _R2_**) and recommended the placement in the project of an organizational change manager (OCM) either internally or externally engaged to mitigate the risk. The State has responded with an organization change plan, which addresses the risk in this way: "Rather than a single person assigned to leading change for BGS, we will be using a decentralized change agent model which is a better fit for this project as each module is unique to a business functions of the five divisions that maintain our portfolio of state facilities. With this approach, we will be leveraging multiple change agents in each division." We think this is a reasonable and creative approach, likely to succeed.
- We did not find an existing platform for disseminating to users information about the project, its objectives, its progress, and their role in the implementation. We identified this as a risk (**_RISK_ID# _R3_**) and recommended the State mitigate the risk by developing a communication platform to reach ""front-line"" users on a regular and effective basis. The State responded, "BGS has an existing SharePoint site for this project. We will also communicate through all company meetings, smaller team meetings and regular email and newsletter style communications." We think that this approach is fine, especially if implemented in cooperation with the change agent model above.
- The project team is relatively small, and the team members have many claims on their time. Availability and responsiveness of BGS project personnel will be critical to cost and timeline during implementation and adoption. We identified this as a risk (**_RISK_ID# _R6_**). The State responded that "BGS will develop and embrace a clear internal project RACI. We will assign internal project member roles to align with the vendor suggested Client Core Team. The phase approach for implementation will allow for sub-teams will be involved for discrete periods like [Agile development –*ed.*] sprints and not for [the] full deployment timeline." We agree that this is a good approach.

  We note that BGS is currently administered by an Acting Commissioner who strongly supports this project. The appointment of a Commissioner could hypothetically bring to the top of the organization a person who does not feel as strongly enthusiastic about this project. We identified this as a risk (**_RISK_ID# _R10_**). Strong support at the top executive level is crucial to the success of the project and to securing funding. In response to this risk, the State points out that the Acting Commissioner was appointed from the Deputy Commissioner position (which remains open) and would be likely to continue as Deputy Commissioner with the appointment of a Commissioner, continuing her strong support for the project. The existing Directors are

united and consistent in their enthusiasm for the project. This high level of support across the executive level would be likely to positively inform a new Commissioner's support of the project.

Thus, BGS would at this time accept the risk, and we concur.

## 7.3 DO THE MILESTONES AND DELIVERABLES PROPOSED BY THE VENDOR PROVIDE ENOUGH DETAIL TO HOLD THEM ACCOUNTABLE FOR MEETING THE BUSINESS NEEDS IN THESE AREAS:

### 7.3.1 A. PROJECT MANAGEMENT

The vendor's project management plan, including communication plan and meetings embedded in their milestones and deliverables, indicate significant experience with implementations of this sort. Experiences of other AssetWorks customers indicate a high degree of satisfaction with their project management expertise. Although we do not see specific project management certifications indicated in their SOW, the project management standards described in the SOW are extensive and appropriate to a project of this scope.

### 7.3.2 B. TRAINING

The vendor employs a "train-the-trainer" approach, in which the vendor trains up to 10 individuals selected by the State. These in turn use materials developed by the vendor to promulgate use information throughout the State user base. The vendor training program generally includes:

- Classroom Introduction to AiM
- Classroom instruction for each functional area of the application.
- Hands-on end-user training for each user
- Training for selected users on specific subjects, such as Work Control Center, Materials (Inventory) Management, Report Writing, System Administration, etc.
- Development of course material and handouts for classroom training
- Development of end-user data entry instructions for specific tasks

In general, this seems to be a good approach, as it embeds training knowledge in State resource persons. One other AssetWorks customer (City of Los Angeles) reported that this training approach broke down when one of their modules was implemented – however, this single module had over 300 users, greatly exceeding what Vermont is likely to encounter at any single module training period. (In the event, the City of Los Angeles developed a change order request to employ additional vendor training help. They were well satisfied with the result.)

### 7.3.3 C. TESTING

Testing is an integral part of the vendor's implementation plan. User stories – both those suggested by the vendor and those developed by BGS – are used along with business process analyses to plan the configuration of various modules. When those modules are delivered in their "draft" state, they are subjected to User Acceptance Testing (UAT) by the State in the testing environment, a secure

environment separated logically from the production environment. Bugs, problems, needed changes are identified and corrected before the module is subjected to final testing, loaded with live data, and once accepted by the State, made available in the production environment. We have no concerns about testing as part of the implementation.

### 7.3.4 D. DESIGN

Design in this implementation refers primarily to configuration of existing modules – there should be little or no custom code. This is in keeping with State preferences. Actual coding of modules (e.g., for new functionality in new releases) takes place in secure environments, with secure coding practices, as preferred by the State.

### 7.3.5 E. CONVERSION (IF APPLICABLE)

The vendor provides Data Load worksheet templates for the State to prepare data for each module. Much of the State's existing data is housed in spreadsheets; however, the State expects to take a largely "start from scratch" approach, and we think this is appropriate, as data in various spreadsheets is currently in unrelated forms.

Sample data is used during module development. Live data is loaded when the module is ready to go live.

### 7.3.6 F. IMPLEMENTATION PLANNING

Each module's Implementation Planning phase includes the following tasks:

- Kickoff call
- Roles and Responsibilities
- Review Statement of Work
- Resource Requirements
- Implementation Timeline
- Assignment of Deliverables
- Prepare Preliminary Implementation Plan
- Prepare Project Documentation (i.e., communication plans)
- Training: Initial Data Load Template Review

We appreciate the vendor's attention to detail in the Implementation Planning Phase. It shows an understanding of the needs of the customer (i.e., the State) for frequent communication during this largely preparatory time.

### 7.3.7 G. IMPLEMENTATION

The vendor has provided an extremely detail Project Services and Timeline table for the implementation, showing Cost, Task Name, Billable Hours, Duration, Start, Finish, and vendor resource (i.e., who is responsible) for each task. In all, about 400 individual tasks are listed in order, their sequence deriving from the main deliverables listed above.

We find this presentation to be very clear, understandable, and useful to the State, particularly in understand the process and anticipate steps once it is underway.

## 7.4 DOES THE STATE HAVE A RESOURCE LINED UP TO BE THE PROJECT MANAGER ON THE PROJECT? IF SO, DOES THIS PERSON POSSESS THE SKILLS AND EXPERIENCE TO BE SUCCESSFUL IN THIS ROLE IN YOUR JUDGMENT?

Yes. The current Project Manager (PM) is a member of ADS Project Management staff. Our experience of this PM's work during the present review demonstrates that she has the organizational, time management, and team communication skills to successfully steward this project for the State. This PM is a Certified Scrum Master (CSM), an Agile-oriented certification, and does not hold Project Management Professional (PMP) credentials. In the implementation of this proposed project, we anticipate that recurring need will be keeping the State project team responsive in a timely way to the vendor's need for State decisions, approvals, requirements refinement, etc. (See for example risk ID #R6 in Section 7.2, *above*). CSM skills will be especially useful in this situation.

An ADS Portfolio Manager is and has been monitoring the project since its inception, including the present review.

We have no concerns about any ADS personnel on this project.

**Additional Comments on Implementation Plan:**

***none***

# 8 COST ANALYSIS AND MODEL FOR BENEFIT ANALYSIS

## 8.1 ANALYSIS DESCRIPTION:

*Provide a narrative summary of the cost benefit analysis conducted.*

It is not unusual, for a large State project that automates previously disparate manual business processes, to have difficulty in establishing the actual costs of the processes being automated. This is because the *tangible* costs of doing business – such as those associated with small-scale databases, desktop productivity software such as spreadsheets, phone lines and email – are likely to be quite low in the manual systems; while the costs of State employees' *loss of productivity* are difficult to quantify. Consequently, the *tangible* benefits – described as those with a reliable dollar figure – are few, while the intangible benefits – as described below, are many. These intangible benefits are primarily business process and productivity improvements.

However, as the State Auditor's report pointed out, business process inefficiencies can have a serious cost associated with them. We view the benefits of this project as going far beyond automation of processes into, more importantly, *integration* of business processes, potentially and even very likely leading to the kinds of improvements and savings (in such areas as deferred maintenance) that the legislature and government seek.

So, we urge the reader to look past the fairly bare-bones dollars-and-cents (tangible) benefits to the probably more important intangible – but expected – benefits.

## 8.2 ASSUMPTIONS:

*List any assumptions made in your analysis.*

- Cost assumptions are as described in **Section 10,** *below*.
- We assume the validity of program accomplishments, results, and benefits as described in internal assessments of improvements to business processes and productivity.

## 8.3 FUNDING:

*Provide the funding source(s). If multiple sources, indicate the percentage of each source for both Acquisition Costs and on-going Operational costs over the duration of the system/service lifecycle.*

All costs in the presently proposed project would be supported 100% by State funding. In the existing economic environment, especially in light of the uncertainties that have arisen as a result of the Covid-19 pandemic, there is a possibility that project funding might become unavailable. We identified this as a (**_RISK_ID# _R1_**) and recommend that the State continue project development and accept the risk.

The State responds “BGS has met with finance and we have multiple ways the project can be funded. There is a strong commitment from leadership including the project is relevant to COVID 19 response.” We agree with this approach.

## 8.4 TANGIBLE COSTS & BENEFITS:

*Provide a list and description of the tangible costs and benefits of this project. Its “tangible” if it has a direct impact on implementation or operating costs (an increase = a tangible cost and a decrease = a tangible benefit). The cost of software licenses is an example of a tangible cost. Projected annual operating cost savings is an example of a tangible benefit*.

- Savings over 5-year project lifecycle of retiring existing work order system after proposed project implementation: $226, 145
- Savings over 5-year project lifecycle of foregoing outsourced annual facility condition assessment: $800,000*

**Table 10 - Total Tangible Benefits**

| | |
|---|---|
| **Total projected tangible benefits:** | **$ 1,026,145.00** |
| **Total projected costs (project lifecycle:** | $ 2,266,745.83 |
| **Total Tangible Benefit (Cost Savings)** | $(1,240,600.83) |

**$200,000 / year for lifecycle years 2 – 4. In year one, outsourced assessment would likely still be necessary as IWMS system goes live and is populated with data.*

## 8.5 INTANGIBLE COSTS & BENEFITS:

*Provide a list and descriptions of the intangible costs and benefits. Its "intangible" if it has a positive or negative impact but is not cost related. Examples: Customer Service is expected to improve (intangible benefit) or Employee Morale is expected to decline (intangible cost*)

### THE STATE EXPECTS THE FOLLOWING INTANGIBLE BENEFITS:

| Business Value | Business Value Description<br>*Include explanations of any significant concerns* |
|---|---|
| **Lease Tracking and Cost Avoidance** | Lease management module provides monitoring and automation of lease payables and receivables; accurate tracking of lease terms will allow the State to make decisions about renewal, avoiding significantly increased costs. |
| **Compliance** | Legislative reporting requirements around major maintenance and deferred maintenance are expanding and this system will be necessary to provide accurate reporting. Provides detailed reporting for Rating Agencies. |
| **Customer Service** | Improved work order processing, move requests, etc. Easier access for our customers to the reporting system, more positive control of opening, closing and moving tickets that will feed tools that help staff identify trends, issues and support trade off analysis for timing larger investments |
| **Compliance** | Decision support for capital investments, better control of space allocation, reduced staff time for tracking time and invoices. Will enable dollar in/dollar out reconciliation and provide tools to attack $12million deficit in property management fund. |
| **Risk Reduction** | Closer tracking of performance of equipment and other facility elements will better anticipate system failures.<br><br>Addresses several key findings in recent audit:<br><br>**According to BGS, the IWMS modules, including capital project & project management, asset management & analysis and operation & maintenance modules together will address some of the findings including specifically the State Auditor's recommendations 1-10 in the 2017 report entitled** Capital Projects: Department of Buildings and General Services – *Projects Consistently Exceeded Cost and Schedule Estimates;* |

| | |
|---|---|
| | *BGS' Process Weaknesses Hinder Its Ability to Improve Capital Project Management*[7] |
| **Productivity** | Senior-level BGS personnel currently spend significant meeting time communicating and coordinating information about assets, work, plans, etc., which will be automated in the new system, freeing them for other tasks. |

## 8.6 COSTS VS. BENEFITS:

*Do the benefits of this project (consider both tangible and intangible) outweigh the costs in your opinion? Please elaborate on your response*.

We judge that the above intangible benefits are not only significant, but important for the State to achieve its goals of process improvements leading to cost savings at BGS, in areas such as deferred maintenance, non-duplication of work, sequencing of work, and other important areas. We would expect significant eventual cost savings; however, these may only be determined *ex post facto*, and attributing them directly to this project would probably be based on anecdotal evidence.

## 8.7 IT ABC FORM REVIEW:

*Review the IT ABC form (Business Case/Cost Analysis) created by the Business for this project. Is the information consistent with your independent review and analysis? If not, please describe. Is the lifecycle that was used appropriate for the technology being proposed? If not, please explain*.

The IT ABC form projected a lifecycle cost of $ 2,068,020.90 compared with our analysis of the total lifecycle cost of the proposed project of $ 2,266,745.83. **This represents a nominal increase over the IT ABC estimate of 109.61%. The IT ABC form projection was quite accurate.**

Narrative and technical assessments in the IT ABC form are accurate and representative of the proposed project.

**Additional Comments on the Cost Benefit Analysis:**

***none***

[7] https://auditor.vermont.gov/sites/auditor/files/documents/BGS%20Capital%20Projects%20Final%20Audit%20Report%20-1.pdf, June 16, 2017

# 9 ANALYSIS OF ALTERNATIVES

## 9.1.1 IMPLEMENTATION/OPERATIONAL APPROACHES

We consider here three possible approaches:

### IN HOUSE SOLUTIONS

An in-house solution is where the software solution for IWMS functions, such as data collection and data presentation, as well as the hardware to support the system, is managed by BGS and the State's Information Technology resources. Some states use contracted resources to staff projects or for staff augmentation.

**This approach is generally deprecated in Vermont State Government for data-based projects for several reasons: Vermont does not have a large, dedicated in-house development staff; there is not generally a large development skill pool in the State; Vermont explicitly prefers cloud-based solutions as more resilient and cost-effective.**

### THIRD-PARTY VENDOR SOLUTIONS

Third party hosted solutions are IWMS software solutions developed, maintained, and hosted by a third-party software vendor and sold to the State (i.e., BGS). Third party hosted solution vendors will typically manage the software for several governmental customers (as entirely separate instances of the same product). Most third party hosted solution vendors will maintain standard core software offered across all customers with some ability to customize per customer.

**This is the approach chosen for the current and proposed IWMS project.**

### THIRD PARTY SUPPORTED SOLUTIONS

Third party supported solutions are solutions that are hosted in-house with part of the information technology functions supported by a third-party vendor. Third party supported functions can range from software development to integration support. Some states have contracted the development of their IWMS system to a third party with the daily system management responsibilities falling to in-house staff. Others have contracted some aspects of the functionality, such as data collection or integration, to a third party.

**For a small state like Vermont, this approach has many of the same disadvantages of the first approach. It requires highly secure, geographically separated and redundant data centers, a potentially very large capital investment in depreciating hardware, and an employment pool of hardware and software skilled operators.**

### CONCLUSION

***Given Vermont's IT Strategic Principles and goals, and its Enterprise Architectural Guiding Principles, the second approach (Third Party Vendor Solution) is clearly appropriate. At this time, it is also the choice of many states, as shown below.***

## 9.1.2 VENDOR CHOICE

.

**Table 11 – Some IWMS Vendors**

| State | Vendor |
|---|---|
| **Florida** | IBM – Tririga platform |
| **Univ. of Maine** | AssetWorks AiM |
| **Massachusetts** | IBM – Tririga platform |
| **Oregon** | Internal Computerized Maintenance Management System (has some of the same functionality as proposed IWMS) |
| **Virginia** | Trimble – Manhattan IWMS |
| **City of Los Angeles** | AssetWorks AiM |

Major vendors of IWMS products include:[8]

- Accruent, LLC
- Archibus, Inc
- AssetWorks, LLC
- Facilio Inc.
- FASEAS NV (Spacewell)
- FM:Systems Group, LLC
- FSI (FM Solutions) Limited
- IBM (TRIRIGA)
- Indus Systems, Inc.
- Ioffice Corporation
- MCS Corp
- MRI Software LLC
- Oracle
- Nuvolo Technologies Corp

[8] Transparency Market Research, https://www.transparencymarketresearch.com/integrated-workplace-management-system-market.html, accessed Aug 01, 2020

- Planon Group, Qube Global Software Ltd.
- Trimble Navigation Limited (Manhattan)
- Visual Lease, LLC,
- zLink, Inc.

Selection of an IWMS vendor depends greatly on the needs of the entity – we note that many vendors' products are more oriented to Enterprise Resource Planning (ERP) needs. Vermont fulfills this need with its existing VISION system, which is an Oracle (PeopleSoft) product. Integration with an ERP is essential for an effective IWMS operation, and integration of AiM with VISION is in-scope for the proposed project. Many of the vendors above focus more on smaller entities, or on specialties such as fleet management or commercial real-estate management.

AssetWorks AiM is a frequent choice of state governments and large universities. It is likely a good fit for Vermont, especially because of its options for data integration, supporting Vermont's IT enterprise directions. Other major governmental entities currently employing AiM include:

State of Alaska, City of Los Angeles, State of New Mexico, State of New York, State of Wisconsin, State of Utah, State of Tennessee, State of Oklahoma, State of Delaware, State of Wyoming, State of Florida Corrections, Commonwealth of Pennsylvania, Commonwealth of Virginia, City of New York, Department of Treasury.

### 9.1.3 ARCHITECTURAL ALTERNATIVES

Given the State's explicit preference for cloud-based solutions, and the preferences implied by the NFRs, any solution chosen by the State would almost certainly reflect the same general architecture as that proposed by the selected vendor, i.e.,

- a cloud-based, SaaS solution,
- hosted in secure, recoverable facilities,
- accessible by users via web/mobile interface,
- with minimal impact on SOV network resources,
- employing a database backend that meets SOV requirements and preferences.

## 9.2 PROVIDE A BRIEF ANALYSIS OF ALTERNATE TECHNICAL SOLUTIONS THAT WERE DEEMED FINANCIALLY UNFEASIBLE.

As described above, in-house solutions are probably financially unfeasible, as well as technologically undesirable, and this leads to their being deprecated under State preferences and strategic direction.

Since this was a sole-source contract, other vendors' solutions were not *specifically* compared for cost and features.

## 9.3 PROVIDE A BRIEF ANALYSIS OF ALTERNATE TECHNICAL SOLUTIONS THAT WERE DEEMED UNSUSTAINABLE.

The existing BGS methods of accomplishing the objectives of this project employ highly "manual" methods of data collection, analysis, communication, and record-keeping, employing a standalone and largely obsolete Work Orders system along with a disparate collection of spreadsheet files, email communication, and regular meetings where information is shared orally. This approach has been and is demonstrable unsustainable, as identified by analysis by the State Auditor, by results in areas such as deferred maintenance, and not least by the assessment of BGS itself.

## 9.4 PROVIDE A BRIEF ANALYSIS OF ALTERNATE TECHNICAL SOLUTIONS WHERE THE COSTS FOR OPERATIONS AND MAINTENANCE WERE UNFEASIBLE.

At the inception of this project, and at the urging of ADS, BGS conducted a serious inquiry, with the aid of ADS Enterprise Architecture (EA) division, into the feasibility of expanding the Agency of Transportation Vermont Asset Management Information System (VAMIS) system to accommodate the needs of BGS. An EA analysis concluded that, although VAMIS has certain functions in common with the business needs of BGS, VAMIS is highly oriented toward transportation assets. Adapting VAMIS to meet BGS IWMS needs such as vertical asset management would require the VAMIS vendor to effectively develop a whole new product (rather than configuring an existing product). It was decided instead that BGS should acquire the AssetWorks IWMS platform, that IWMS and VAMIS should be integrated through a data interface for certain shared data, and that the BGS IWMS would be the system of record for all vertical assets for the State.

We think this is a very reasonable and efficient approach by the State, integrating related information across Agencies but adopting cost-effective and targeted solutions for each.

# 10 IMPACT ANALYSIS ON NET OPERATING COSTS

## 10.1 INSERT A TABLE TO ILLUSTRATE THE NET OPERATING COST IMPACT.

Table 12 - Project Lifecycle Costs

| | Procurement | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Total |
|---|---|---|---|---|---|---|---|
| **Project Cost** | $1,931,933.83 | $66,962.40 | $66,962.40 | $66,962.40 | $66,962.40 | $66,962.40 | $2,266,745.83 |
| **Current Costs** | $245,229.00 | $245,229.00 | $245,229.00 | $245,229.00 | $245,229.00 | $245,229.00 | $(1,471,374.00) |
| **Total Cost** | $1,686,704.83 | $(178,266.60) | $(178,266.60) | $(178,266.60) | $(178,266.60) | $(178,266.60) | $795,371.83 |

Table 13 - Project Lifecycle Cumulative Costs

| | Procurement | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|---|
| **Project Cost Cumulative** | $1,931,933.83 | $1,998,896.23 | $2,065,858.63 | $2,132,821.03 | $2,199,783.43 | $2,266,745.83 |
| **Current Costs Cumulative** | $245,229.00 | $490,458.00 | $735,687.00 | $980,916.00 | $1,226,145.00 | $1,471,374.00 |
| **Cumulative Cost Savings** | $(1,686,704.83) | $(1,508,438.23) | $(1,330,171.63) | $(1,151,905.03) | $(973,638.43) | $(795,371.83) |

## 10.2 PROVIDE A NARRATIVE SUMMARY OF THE ANALYSIS CONDUCTED AND INCLUDE A LIST OF ANY ASSUMPTIONS.

Assumptions:

- Current annual cost has 2 components:
  - Software licensing for the existing work order system, which would be retired on implementation of the new system: $45,229.00
  - An upper estimate of $1M over 5 years for contract renewal of the required annual facility condition assessment, currently outsourced. This contract would be obviated by the proposed solution.
- We assume that the above determination of current costs would continue unchanged for 5 years.
- We further assume that the above current costs capture all the current costs for conducting business processes using the existing, largely manual, methods. In fact, there are certainly other costs to conducting business in this dispersed, somewhat ad-hoc manner; however, no baseline data is available to reliably quantify those costs.

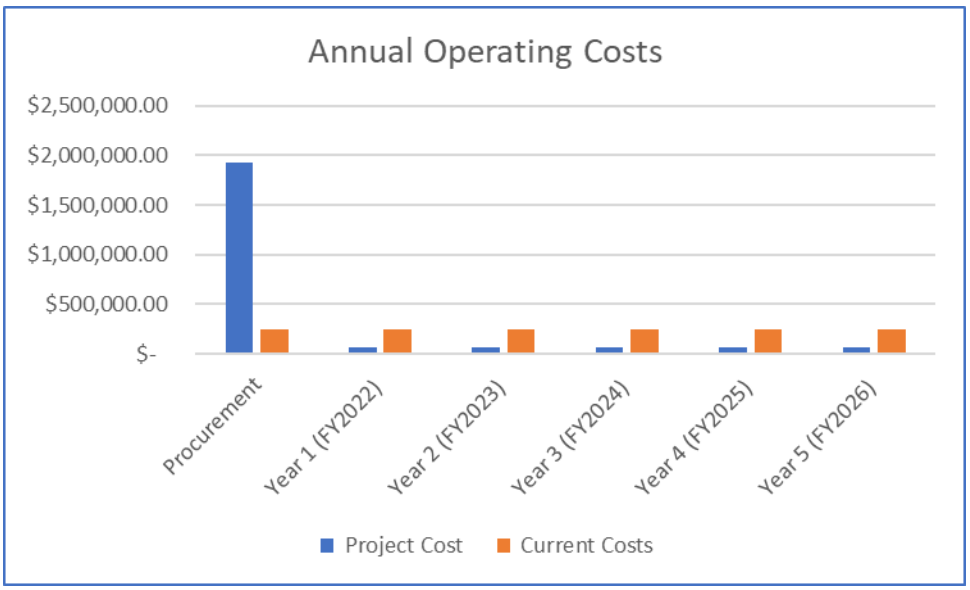


**Figure 1 - Annual Operating Costs**

## 10.3 EXPLAIN ANY NET OPERATING INCREASES THAT WILL BE COVERED BY FEDERAL FUNDING. WILL THIS FUNDING COVER THE ENTIRE LIFECYCLE? IF NOT, PLEASE PROVIDE THE BREAKOUTS BY YEAR.

No federal funding is anticipated for the project as defined at this point.

## 10.4 WHAT IS THE BREAK-EVEN POINT FOR THIS IT ACTIVITY (CONSIDERING IMPLEMENTATION AND ON-GOING OPERATING COSTS)?

**The chart below shows that the difference between the cumulative project cost and a hypothetical cumulative existing cost decreases over the lifecycle.**

Cumulative Cost Savings over lifecycle of project compared to current costs = ($795,372)

There is no "breakeven point" during the project lifecycle, because implementation costs are significant.

However, if hypothetical current costs remained the same, then we could project a breakeven around 10 years out. With the same exercise, if not counting internal SOV personnel costs, then there is breakeven around 7 years.

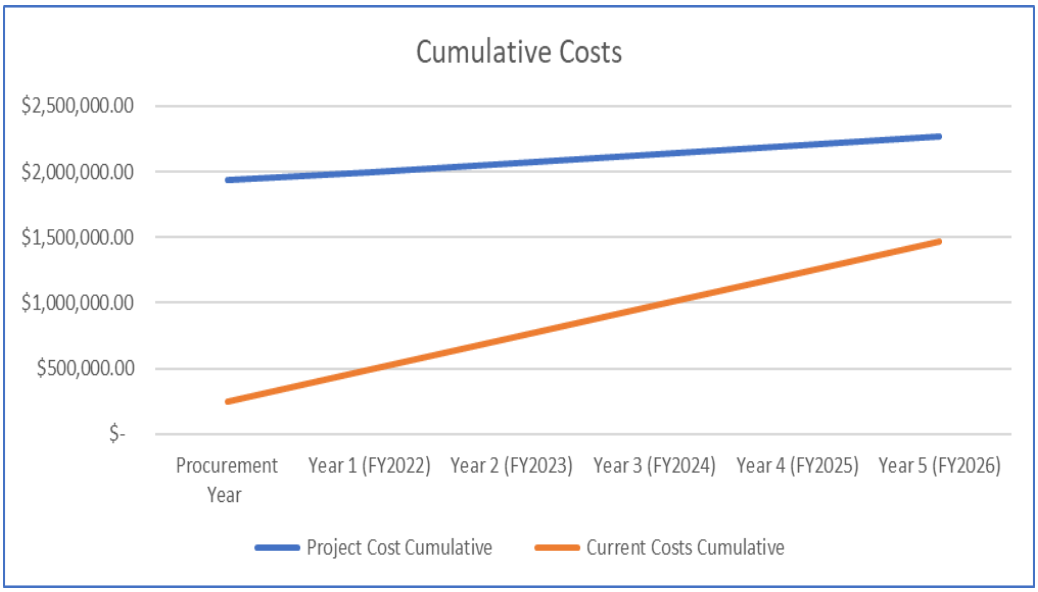


**Figure 2 - Cumulative Cost Impact over Lifecycle**

# 11 SECURITY ASSESSMENT

*Assess Information Security alignment with State expectations. ADS-Security Division will support reviewer and provide guidance on assessment.*

## 11.1 WILL THE NEW SYSTEM HAVE ITS OWN INFORMATION SECURITY CONTROLS, RELY ON THE STATE'S CONTROLS, OR INCORPORATE BOTH?

The IWMS project will have its own controls designated by the vendor. Controls that include policy, procedure, or standards can include state documentation from the SOV

## 11.2 WHAT METHOD DOES THE SYSTEM USE FOR DATA CLASSIFICATION?

The State requires data classification to be done by the State's matrix of sensitivity and compliance requirements. We note that the data compliance table sent to the vendor[9] has no sensitive data types indicated as "relevant to [the] project." This may be the case for the baseline solution; however, we suggest that it would be useful to consider the same matrix in the light of any data integrations to be implemented or contemplated for this project. (For a hypothetical example, could an integration with VISION expose State Financial Data?) Even if the solution is compliant for a given data type (i.e., AWS conducts a SSAE 16 SOC 2 Type 2 audit, the relevant standard for the hypothetical), the data types and required compliance should be identified.

## 11.3 WHAT IS THE VENDOR'S BREACH NOTIFICATION AND INCIDENT RESPONSE PROCESS?

The vendor's breach notification from Attachment D states that they comply with Chapter 62 of Title 9 of the Vermont Statutes and provide notification in the event of unauthorized release of PII

The vendor maintains an internal incident response policy that documents security incident handling procedures. The incident response plan is tested annually. Incident reporting, handling, and response procedures are audited annually to verify effectiveness. Additionally, AWS incident response plans are SOC 2 and ISO 27001 certified.

We expect the results of this testing will be reported regularly to the State and evaluated by the CISO office.

## 11.4 DOES THE VENDOR HAVE A RISK MANAGEMENT PROGRAM THAT SPECIFICALLY ADDRESSES INFORMATION SECURITY RISKS?

The vendor states that "A variety of open-source and commercial security tools are used for vulnerability scanning and penetration testing. Vulnerability scans are performed for every major version release on the application and server side to detect vulnerabilities." We note with approval that

[9] State of Vermont and AssetWorks, *TEC - REVIEWED Hosting_Security Response Form Assetworks_08.17.20.docx*

not only server-side, but also the application is “pen-tested” at identified times. This is important because although the AWS hosting environment is well-known by the State for its security features and processes, the application code itself can provide a point of entry for bad actors. Testing both increased the level of confidence in the security of the solution.

## 11.5 WHAT ENCRYPTION CONTROLS/TECHNOLOGIES DOES THE SYSTEM USE TO PROTECT DATA AT REST AND IN TRANSIT?

These controls would be outlined in the SSP that would be provided to SOV and would be based on NIST 800-53 Moderate controls. AWS data centers maintain System Security Plans for FedRAMP compliance. AWS data center security practices are SOC 2 and ISO 27001 certified. The State should have a high degree of confidence in the data center protection technologies and practices.

Data is encrypted during transit with TLS. The vendor further states that “Transmission confidentiality is monitored through a variety of tools.” Data is encrypted at rest with AES. Databases are secured so that only authorized users can access data over an encrypted connection. Database connections and activity are logged in the system.

## 11.6 WHAT FORMAT DOES THE VENDOR USE FOR CONTINUOUS VULNERABILITY MANAGEMENT, WHAT PROCESS IS USED FOR REMEDIATION, AND HOW DO THEY REPORT VULNERABILITIES TO CUSTOMERS?

The State expects quarterly vulnerability and deficiency reports, along with a Plan Of Actions and Milestones (POA&M) for each deficiency. We recommend that these and any other regularly required reports by memorialized in the contract.

Additionally, Attachment D of the standard contract language requires the following:

*5.1 Vulnerability Testing. The Contractor shall run quarterly vulnerability assessments and promptly report results to the State. Contractor shall remediate all critical issues within 90 days, all medium issues within 120 days and low issues within 180 days. Contractor shall obtain written State approval for any exceptions. Once remediation is complete, Contractor shall re-perform the test.*

## 11.7 HOW DOES THE VENDOR DETERMINE THEIR COMPLIANCE MODEL AND HOW IS THEIR COMPLIANCE ASSESSED?

This is addressed in **Section 11.2**, *above*.

## 11.8 FURTHER COMMENTS ON SECURITY

As described in section 6, Technology Architecture Assessment, sole-source contract procurement process for this project resulted in a situation where many Non-functional Requirements (NFRs) normally transmitted to the vendor in the RFP process, were not addressed by the GSA SOW. Consequently, we at first, in consultation with the ADS Security Division, found it impossible to address many aspects of the security-related questions specifically required for this review (i.e., 11.1 to 11.7 above). This is not to say that the vendor is deficient or incapable of meeting requirements of security, recovery, breach notification, etc., that the State normally requires; indeed, the vendor's record with other governmental entities implies they are well-versed in these aspects. Rather, that they had not been specifically asked to address these requirements.

This risk has been mitigated since that time by the State's request to the vendor, as described in Section 6, above. We now have sufficient information to confidently assess the proposed solution's security stance as meeting or exceeding State requirements.

# 12 RISK ASSESSMENT & RISK REGISTER

The risks identified throughout this review are collected below, along with an assessment of their significance, a description of the State response and timing, and our evaluation of the State response.

## 12.1.1 ADDITIONAL COMMENTS ON RISK

***none***

### 12.1.2 RISK REGISTER

The following table explains the Risk Register components:

| | | |
|---|---|---|
| Risk ID: | Identification number assigned to risk or issue. | |
| Risk Rating: | An assessment of risk significance, based on multiplication of **(probability X impact ratings)** (*see below*). | |
| | **1-9 = low** | See table below |
| | **10-48 = moderate** | |
| | **49-90 high** | |
| Probability: | Assessment of likelihood of risk occurring, scale of **1,3,5,7, or 9**, from least to most likely | |
| Impact: | Assessment of severity of negative effect, scale of **1,3,5,7, or 10**, from least to most severe | |
| Finding: | Review finding which led to identifying a risk | |
| Risk Of: | Nature of the risk | |
| Source: | Project, Proposed Solution, Vendor or Other | |
| Risk domains: | What may be impacted, should the risk occur | |
| State's Planned Risk Strategy | Decision to *avoid*, *mitigate*, or *accept* risk | |
| State's Planned Risk response | Detailed description of response to risk, in order to accomplish decision | |
| Reviewer's Assessment: | Reviewer's evaluation of the State's planned response | |

| Risk Rating Matrix | | | IMPACT | | | | |
|---|---|---|---|---|---|---|---|
| | | | Trivial | Minor | Moderate | Major | Extreme |
| | | | 1 | 3 | 5 | 7 | 10 |
| LIKELIHOOD | Rare | 1 | 1 | 3 | 5 | 7 | 10 |
| | Unlikely | 3 | 3 | 9 | 15 | 21 | 30 |
| | Moderate | 5 | 5 | 15 | 25 | 35 | 50 |
| | Likely | 7 | 7 | 21 | 35 | 49 | 70 |
| | Very Likely | 9 | 9 | 27 | 45 | 63 | 90 |

| | | | |
|---|---|---|---|
| Risk ID: R1 | Rating: | **50** | |
| | Likelihood: | **5** | |
| | Impact: | **10** | |
| Finding: | Availability of funding is uncertain, primarily due to budget constraints that may arise due to the pandemic | | |
| Risk Of: | Project termination | | |
| Risk domains: | project success | | |
| State's Planned Risk Response: | BGS has met with finance and we have multiple ways the project can be funded. There is a strong commitment from leadership including the project is relevant to COVID 19 response. | | |
| Reviewer Recommendation | Accept:<br>Continue existing approach<br>**(NOTE: I cannot usefully evaluate the likelihood of this risk occurring, since it involves political and administrative decisions reliant on external variables. Therefore, I've indicated the likelihood at "5", i.e. 50/50 or "moderate")** | | |
| Reviewer's Assessment of State's Planned Response | Concur | | |
| Timing | Before contract execution | | |

| | | | |
|---|---|---|---|
| Risk ID: R2 | Rating: | **50** | |
| | Likelihood: | **5** | |
| | Impact: | **10** | |
| Finding: | There is a great deal of enthusiasm for the project, but nonetheless organizational change could be daunting, and could impact both the implementation and adoption processes. | | |
| Risk Of: | implementation delay, reliance on deprecated business processes | | |
| Risk domains: | project success, timeline, cost | | |
| State's Planned Risk Response: | Rather than a single person assigned to leading change for BGS, we will be using a decentralized change agent model which is a better fit for this project as each module is unique to a business functions of the five divisions that maintain our portfolio of state facilities. With this approach, we will be leveraging multiple change agents in each division. | | |
| Reviewer Recommendation | Mitigate:<br>Assign an Organizational Change Manager, either internally or outsourced | | |
| Reviewer's Assessment of State's Planned Response | Concur | | |
| Timing | Before implementation | | |

| | | | |
|---|---|---|---|
| Risk ID: R3 | Rating: | **35** | |
| | Likelihood: | **5** | |
| | Impact: | **7** | |
| Finding: | There is currently no communication model or platform for informing and preparing potential users of the system about project features, benefits, timeline for implementation, or progress status. | | |
| Risk Of: | implementation delay, reliance on deprecated business processes | | |
| Risk domains: | business benefits, timeline | | |
| State's Planned Risk Response: | BGS has an existing SharePoint site for this project. We will also communicate through all company meetings, smaller team meetings and regular email and newsletter style communications. | | |
| Reviewer Recommendation | Mitigate:<br>develop and promulgate communication platform to reach "front-line" users on a regular and effective basis | | |
| Reviewer's Assessment of State's Planned Response | Concur | | |
| Timing | During implementation | | |

| | | | |
|---|---|---|---|
| Risk ID: R4 | Rating: | **15** | |
| | Likelihood: | **3** | |
| | Impact: | **5** | |
| Finding: | The vendor has not been asked to confirm alignment with Non-Functional Requirements in some areas | | |
| Risk Of: | non-compliance with SOV requirements and/or standards | | |
| Risk domains: | Enterprise Architecture | | |
| State's Planned Risk Response: | Relevant SOV requirements, especially concerning security, were developed by EA & CISO, and sent to vendor.<br>***At time of writing, detailed responses have been received and assessed for this Independent Review and demonstrate clear vendor alignment with appropriate NFRs, in our view effectively mitigating this risk****. (See Section 6, Technology Architecture, above)* | | |
| Reviewer Recommendation | Mitigate:<br>Focused approach to complete confirmation of requirements, involving EA, CISO, and business analyst, with vendor responding | | |
| Reviewer's Assessment of State's Planned Response | Concur. *(See Section 6, Technology Architecture, above)* | | |
| Timing | Before contract execution | | |

| | | | |
|---|---|---|---|
| Risk ID: R5 | Rating: | **50** | |
| | Likelihood: | **5** | |
| | Impact: | **10** | |
| Finding: | Vendor's proposal is a Time & Materials offer. The vendor has indicated several areas where costs could rise if their estimate of State needs, requirements, or capacity is exceeded. | | |
| Risk Of: | Cost increase | | |
| Risk domains: | Cost | | |
| State's Planned Risk Response: | BGS will negotiate a Firm Fixed Price offer with vendor; this might increase final cost but would help in securing funding at project outset | | |
| Reviewer Recommendation | Accept:<br>Implement clear and consistent cost control and tracking measures and memorialize in contract<br>--OR--<br>Avoid:<br>Negotiate Firm Fixed Price offer - evaluate and accept if deemed reasonable | | |
| Reviewer's Assessment of State's Planned Response | Concur | | |
| Timing | Before contract execution | | |

| | | | |
|---|---|---|---|
| Risk ID: R6 | Rating: | **15** | |
| | Likelihood: | **3** | |
| | Impact: | **5** | |
| Finding: | The project team is relatively small, and the team members have many claims on their time. Availability and responsiveness of BGS project personnel will be critical to cost and timeline during implementation and adoption. | | |
| Risk Of: | implementation delay, cost increase | | |
| Risk domains: | project success, timeline, cost | | |
| State's Planned Risk Response: | BGS will develop and embrace a clear internal project RACI. We will assign internal project member roles to align with the vendor suggested Client Core Team. The phase approach for implementation will allow for sub-teams will be involved for describe period like sprints and not for full deployment timeline. | | |
| Reviewer Recommendation | Mitigate:<br><br>-- Develop and embrace a clear internal project RACI<br><br>-- Assign internal project members roles aligned with the vendor's suggested Client Core Team (pp. 43-44 of 77 in AssetWorks SOW ver. 3). (Or develop alternative structure in consultation with vendor) | | |
| Reviewer's Assessment of State's Planned Response | Concur | | |
| Timing | Before or during implementation | | |

| | | | |
|---|---|---|---|
| Risk ID: R8 | Rating: | **15** | |
| | Likelihood: | **3** | |
| | Impact: | **5** | |
| Finding: | Vendor's proposal is a Time & Materials offer. Under a T&M contract, it is possible for costs to be below that estimated. (Example: Another state that is a customer of this vendor has reported anecdotally a final cost of about $1.97M on an offer estimated at $2.2M) | | |
| Risk Of: | Final cost of project could be less than that projected by vendor's SOW<br>**[NOTE: This is a positive risk]** | | |
| Risk domains: | Cost | | |
| State's Planned Risk Response: | Negotiate firm fixed price contract | | |
| Reviewer Recommendation | Enhance:<br>If contract is to be T&M, devote some project oversight to tracking cost items such as number of users, unneeded functionality or services, etc.<br>--OR--<br>Avoid (obviate):<br>Negotiate firm fixed price contract | | |
| Reviewer's Assessment of State's Planned Response | Concur | | |
| Timing | Before contract execution | | |

| | | | |
|---|---|---|---|
| Risk ID: R9 | Rating: | 9 | |
| | Likelihood: | **3** | |
| | Impact: | **3** | |
| Finding: | Within the context of a generally very favorable assessment of the vendor's performance, a (non-VT) state government customer of this vendor has reported confusion about the interpretation of number of user licenses. | | |
| Risk Of: | Additional cost | | |
| Risk domains: | Cost | | |
| State's Planned Risk Response: | BGS will request explicit counting methodology from vendor for number of users, sessions, licenses and evaluate in context of BGS needs. | | |
| Reviewer Recommendation | Mitigate:<br>If not already in hand, request explicit counting methodology from vendor for number of users, sessions, licenses etc. and evaluate in context of BGS needs | | |
| Reviewer's Assessment of State's Planned Response | concur | | |
| Timing | before contract execution | | |

| | | | |
|---|---|---|---|
| Risk ID: R10 | Rating: | **30** | |
| | Likelihood: | **3** | |
| | Impact: | **10** | |
| Finding: | BGS is currently administered by an Acting Commissioner who strongly supports this project. The appointment of a Commissioner could hypothetically bring to the top of the organization a person who does not feel as strongly enthusiastic about this project. Similarly, the Deputy Secretary of Administration, to whom the BGS Acting Commissioner reports, is retiring imminently, and hypothetically could be replaced by a less enthusiastic individual. Full support at the top executive level is crucial to the success of the project and to securing funding. | | |
| Risk Of: | Project termination | | |
| Risk domains: | Project success; funding | | |
| State's Planned Risk Response: | The Secretary of the Agency of Administration is supportive of this project. The Acting Commissioner was appointed from the Deputy Commissioner position (which remains open) and would be likely to continue as Deputy Commissioner with the appointment of a Commissioner, continuing her strong support for the project. The existing Directors are united and consistent in their enthusiasm for the project. This high level of support across the executive level would be likely to positively inform a new Commissioner's support of the project. | | |
| Reviewer Recommendation | Accept.<br>Discuss and prepare among executive level for this hypothetical. | | |
| Reviewer's Assessment of State's Planned Response | concur | | |
| Timing | before contract execution | | |

# 13 ATTACHMENTS

**Attachment 1 – Lifecycle Cost Benefit Analysis**

**Attachment 2 – Risk Register**

# Attachment 1: IWMS Cost Spreadsheet ver. 2.0a

| Project Name: | | | Integrated Workplace Management System | | | | | | | Lifecycle Total @ Current Annual Cost | Benefit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Description | Qty | Unit Price | | Maintenance | Maintenance | Maintenance | Maintenance | Maintenance | Total | | |
| Fiscal Year | | | Procurement | Year 1 (FY2022) | Year 2 (FY2023) | Year 3 (FY2024) | Year 4 (FY2025) | Year 5 (FY2026) | | | |
| **Hardware** | | | | | | | | | | | |
| Server Hardware | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| Network Upgrades | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| Desktop Hardware | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| Other | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| **Hardware Total** | | | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| **Software** | | | | | | | | | | | |
| Software | | | $ 691,492.87 | $ - | $ - | $ - | $ - | $ - | $ 691,492.87 | | |
| AiM Hosting - 30 users | | | $ - | $ 32,281.20 | $ 32,281.20 | $ 32,281.20 | $ 32,281.20 | $ 32,281.20 | $ 161,406.00 | | |
| ReADY Hosting - unlimited users | | | $ - | $ 32,281.20 | $ 32,281.20 | $ 32,281.20 | $ 32,281.20 | $ 32,281.20 | $ 161,406.00 | | |
| Single Sign-On (SSO) Hosting - unlimited users | | | $ - | $ 2,400.00 | $ 2,400.00 | $ 2,400.00 | $ 2,400.00 | $ 2,400.00 | $ 12,000.00 | | |
| **Software Total** | | | **$ 691,492.87** | **$ 66,962.40** | **$ 66,962.40** | **$ 66,962.40** | **$ 66,962.40** | **$ 66,962.40** | **$ 1,026,304.87** | **$ 226,145.00** | **$ (800,159.87)** |
| **Consulting** | | | | | | | | | | | |
| Third-Party - Technical | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| Third-Party - Business | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| Independent Review | | | $ 17,769.00 | $ - | $ - | $ - | $ - | $ - | $ 17,769.00 | | |
| **Consulting Total** | | | **$ 17,769.00** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ 17,769.00** | **$ -** | **$ (17,769.00)** |
| **Training** | | | | | | | | | | | |
| [Vendor Training is included in Implementation Services below] | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| Other | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| **Training Total** | | | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| **Implementation Services** | | | | | | | | | | | |
| Application Installation - AiM & AiM IQ | | | $ 15,324.80 | $ - | $ - | $ - | $ - | $ - | $ 15,324.80 | | |
| Application Installation - ReADY Request | | | $ 15,324.80 | $ - | $ - | $ - | $ - | $ - | $ 15,324.80 | | |
| AiM Assessment & Needs Analysis | | | $ 83,937.39 | $ - | $ - | $ - | $ - | $ - | $ 83,937.39 | | |
| AiM Capital Planning and Project Management | | | $ 198,440.91 | $ - | $ - | $ - | $ - | $ - | $ 198,440.91 | | |
| AiM Lease Management | | | $ 63,362.08 | $ - | $ - | $ - | $ - | $ - | $ 63,362.08 | | |
| AiM Operations & Maintenance | | | $ 163,130.12 | $ - | $ - | $ - | $ - | $ - | $ 163,130.12 | | |
| ReaDY Request | | | $ 70,729.60 | $ - | $ - | $ - | $ - | $ - | $ 70,729.60 | | |
| Space Management | | | $ 94,124.53 | $ - | $ - | $ - | $ - | $ - | $ 94,124.53 | | |
| ReADY Space | | | $ 30,723.17 | $ - | $ - | $ - | $ - | $ - | $ 30,723.17 | | |
| Drawing Preparation Services (optional) | | | $ 43,776.56 | $ - | $ - | $ - | $ - | $ - | $ 43,776.56 | | |
| **Implementation Services Total** | | | **$ 778,873.96** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ 778,873.96** | **$ 800,000.00** | **$ 21,126.04** |
| **Personnel - Additional** | | | | | | | | | | | |
| **State Personnel** | | | | | | | | | | | |
| BGS personnel costs | | | $ 361,536.00 | $ - | $ - | $ - | $ - | $ - | $ 361,536.00 | | |
| ADS project costs (PM, EA, Security Analyst, Bus. Analyst) | | | $ 82,262.00 | $ - | $ - | $ - | $ - | $ - | $ 82,262.00 | | |
| Organization Change Mgr.[1] | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | |
| **Personnel - Additional Total** | | | **$ 443,798.00** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ 443,798.00** | **$ -** | **$ (443,798.00)** |
| **Grand Total** | | | **$ 1,931,933.83** | **$ 66,962.40** | **$ 66,962.40** | **$ 66,962.40** | **$ 66,962.40** | **$ 66,962.40** | **$ 2,266,745.83** | **$ 1,026,145.00** | **$ (1,240,600.83)** |

**ATTACHMENT 2 - INTEGRATED WORKPLACE SYSTEM INDEPENDENT REVIEW -- Risk and Issues Register** -- version 5.0.a **2020/September/30 -- Paul E. Garstki, JD -- Paul Garstki Consulting**

**RISKS** **What is the finding that leads to identifying a risk? (This is a highly condensed version that is explained more fully in the report narrative)** **What are the risks implied by the finding?** **What aspects of the project are at risk if the risk(s) are realized?** **What is the State's response to the risk?** **What is the Independent Reviewer recommending?** **Latest the response should take place** **Reviewer's assessment of likelihood risk is realized 1,3,5,7, or 10** **Reviewer's assessment of impact if risk is realized 1,3,5,7, or10**

**1-9 low**
**10-48 medium**
**49-100 high**

**Note: Risk ID # list may have gaps, in order to maintain consistency with earlier drafts**

| Risk # | Finding | risk of | risk domains | SOV response | Reviewer Recommendation | Reviewer Assessment of SOV Response | Timing | likelihood 1-10 | impact 1-10 | total rating |
|---|---|---|---|---|---|---|---|---|---|---|
| **R1** | Availability of funding is uncertain, primarily due to budget constraints that may arise due to the pandemic | Project termination | project success | BGS has met wth finance and we have multiple ways the project can be funded. There is a strong committment from leadership including the project is relavent to COVID 19 response. | Accept:<br>Continue existing approach<br>**(NOTE: I cannot usefully evaluate the likelihood of this risk occurring, since it involves political and administrative decisions reliant on external variables. Therefore, I've indicated the likelhood at "5", i.e. 50/50 or "moderate")** | Concur | Before contract execution | **5** | **10** | **50** |
| **R2** | There is a great deal of enthusiasm for the project, but nonetheless organizational change could be daunting, and could impact both the implementation and adoption processes. | implementation delay, reliance on deprecated business processes | project success, timeline, cost | Rather than a single person assigned to leading change for BGS, we will be using a decentralized change agent model which is a better fit for this project as each module is unique to a business functions of the five divisions that maintain our portfolio of state facilities. With this approach, we will be leveraging multiple change agents in each division. | Mitigate:<br>Assign an Organizational Change Manager, either internally or outsourced | Concur | Before implementation | **5** | **10** | **50** |
| **R3** | There is currently no communication model or platform for for informing and preparing potential users of the system about project features, benefits, timeline for implementation, or progress status. | implementation delay, reliance on deprecated business processes | business benefits, timeline | BGS has an existing sharepoint site for this project. We will also communicate through all company meetings, smaller team meetings and regular email and newsletter style communications. | Mitigate:<br>develop and promulgate communication platform to reach "front-line" users on a regular and effictive basis | Concur | During implementation | **5** | **7** | **35** |
| **R4** | The vendor has not been asked to confirm alignment with Non-Functional Requirements in some areas | non-compliance with SOV requirements and/or standards | Enterprise Architecture | Relevant SOV requirements, especially concerning security, were developed by EA & CISO, and sent to vendor.<br><br>At time of writing, detailed responses have been received and assessed for this Independent Review and demonstrate clear vendor alignment with appropriate NFRs, in our view effectively mitigating this risk | Mitigate:<br>Focused approach to complete confirmation of requirements, involving EA, CISO, and business analyst, with vendor responding | Concur | Before contract execution | **3** | **5** | **15** |
| **R5** | Vendor's proposal is a Time & Materials offer. The vendor has indicated several areas where costs could rise if their estimate of State needs, requirements, or capacity is exceeded. | Cost increase | Cost | BGS will negotiate a Firm Fixed Price offer with vendor; this might increase final cost but would help in securing funding at project outset | Accept:<br>Implement clear and consistent cost control and tracking measures and memorialize in contract<br>--OR--<br>Avoid:<br>Negotiate Firm Fixed Price offer - evaluate and accept if deemed reasonable | Concur | Before contract execution | **5** | **10** | **50** |
| **R6** | The project team is relatively small, and the team members have many claims on their time. Availability and responsiveness of BGS project personnel will be critical to cost and timeline during implementation and adoption. | implementation delay, cost increase | project success, timeline, cost | BGS will develop and embrace a clear internal project RACI. We will assign internal project member roles to alighn with the vendor suggested Client Core Team. The phase approach for implementation will allow for sub-teams will be involved for descrite period like sprints and not for full deployment timeline. | Mitigate:<br><br>-- Develop and embrace a clear internal project RACI<br><br>-- Assign internal project members roles aligned with the vendor's suggested Client Core Team (pp. 43-44 of 77 in AssetWorks SOW ver. 3). (Or develop alternative structure in consultation with vendor) | Concur | Before or during implementation | **3** | **5** | **15** |
| **R8** | Vendor's proposal is a Time & Materials offer. Under a T&M contract, it is possible for costs to be below that estimated. (Example: Another state that is a customer of this vendor has reported anecdotally a final cost of about $1.97M on an offer estimated at $2.2M) | Final cost of project could be less than that projected by vendor's SOW **[NOTE: This is a positive risk]** | Cost | Negotiate firm fixed price contract | Enhance:<br>If contract is to be T&M, devote some project oversight to tracking cost items such as number of users, unneeded funtionality or services, erc.<br>--OR--<br>Avoid (obviate):<br>Negotiate firm fixed price contract | Concur | Before contract execution | **3** | **5** | **15** |
| **R9** | Within the context of a generally very favorable assessment of the vendor's performance, a (non-VT) state government customer of this vendor has reported confusion about the interpretation of number of user licenses. | Additional cost | Cost | BGS will request explicite counting methodology from vendor for number of usres, sessions, licenses and evaluater in context of BGS needs. | Mitigate:<br>If not already in hand, request explicit counting methodology from vendor for number of users, sessions, licenses etc. and evaluate in context of BGS needs | Concur | Before contract execution | **3** | **3** | **9** |

| Risk # | Finding | risk of | risk domains | SOV response | Reviewer Recommendation | Reviewer Assessment of SOV Response | Timing | likelihood 1-10 | impact 1-10 | total rating |
|---|---|---|---|---|---|---|---|---|---|---|
| **R10** | BGS is currently administered by an Acting Commissioner who strongly supports this project. The appointment of a Commissioner could hypothetically bring to the top of the organization a person who does not feel as strongly enthusiastic about this project. Similarly, the Deputy Secretary of Administration, to whom the BGS Acting Commissioner reports, is retiring imminently, and hypothetically could be replaced by a less enthusiastic individual. Full support at the top executive level is crucial to the success of the project and to securing funding. | Project termination | Project success; funding | The Secretary of the Agency of Administration is supportive of this project. The Acting Commissioner was appointed from the Deputy Commissioner position (which remains open) and would be likely to continue as Deputy Commissioner with the appointment of a Commissioner, continuing her strong support for the project. The existing Directors are united and consistent in their enthusiasm for the project. This high level of support across the executive level would be likely to positively inform a new Commissioner's support of the project | Accept:<br>Discuss and prepare among executive level for this hypothetical. | Concur | Before contract execution | **3** | **10** | **30** |