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**M E M O R A N D U M**

January 20, 2017

**TO:** Joint Technology Committee Members

**FROM:** Jean Billingsley, Senior Research Analyst, 303-866-2357

**SUBJECT:** Conveyance Program Application and Database, FY 2017-18 Operating Budget Request, Colorado Department of Labor and Employment

**Summary**

This memorandum responds to a request from the Joint Budget Committee (JBC) to the Joint Technology Committee (JTC) to review a FY 2017-18 operating budget request from the Colorado Department of Labor and Employment (CDLE) regarding the Conveyance Program Application and Database, which would replace the existing AMANDA software system.

In a November 28, 2016 letter to the JTC, the JBC requested a review of the FY 2017-18 operating budget request from CDLE to replace the existing AMANDA software system. Specifically, the JBC requested feedback from the JTC about CDLE's adherence to best practice standards in identifying the technical specifications of the new software system prior to issuing a solicitation.

**Project Description and Status**

The Conveyance section of the Division of Oil and Public Safety (OPS), within CDLE, is responsible for a variety of regulatory functions including establishing and enforcing rules for conveyances as defined in the Elevator and Escalator Certification Act. The Conveyance section is responsible for ensuring that conveyance owners comply with the minimum safety standards within the conveyance industry and currently oversees about 20,000 conveyances annually.

Six years ago, the department engaged a vendor to build and configure a commercial off-the-shelf (COTS) software called AMANDA. AMANDA is used by the Conveyance section, which regulates the installation, alteration, periodic inspection, and testing of conveyances. Conveyances include elevators, platform lifts, personnel hoists, dumbwaiters, escalators,

moving walks, and automated people movers. AMANDA has proven to be inadequate for several reasons resulting from design flaws and implementation issues. As a result, the department has had to rely on workarounds to compensate for missing functionality in AMANDA.

**Operating budget request.** The department is requesting \$445,000 in cash funds spending authority to replace the department's existing AMANDA system. The department says that a replacement for AMANDA is necessary because AMANDA is missing key functionality and is costly and difficult to maintain. Some of the missing functionality in AMANDA that the department expects to correct with the new system include: (1) inspection auditing activities; (2) issuing receipts with online payments; (3) permit status tracking; (4) tracking requests for information; (5) mobile device capability; (6) reconciliation activities for "Authority Having Jurisdiction"; and (7) integration with the license card printer system. The department also explains that the existing AMANDA system's fundamental code that supports business workflow is distributed across the system, thereby making it difficult to make small changes to the code and often resulting in unintended changes that interrupt service. The department further explains that when the Governor's Office of Technology (OIT) modifies underlying functions to enhance the system, OIT effectively becomes the owner of that code.

### **JTC Staff Clarifications**

Below are clarifications about the department's operating budget request, the department's testimony at its JBC hearing in December 2016, and the department's responses to JTC staff questions.

**Existing AMANDA solution and the replacement solution type.** The department says that the existing AMANDA system is a COTS application that has been customized. For the proposed new system, the department says that a cloud solution that is customizable is preferred. Even though AMANDA is also customizable, the department says that AMANDA has design flaws.

As a result of the experiences of implementing AMANDA, the department provided a list of lessons learned that could be applied to the new solution's implementation. Some of these lessons are: (1) managing scope; (2) terminating the contract early if needed; (3) understanding the business need among all team members; and (4) leveraging knowledge of staff and OIT. The department further explains that the AMANDA project was unsuccessful due to: (1) unrealistic expectations of the capability to change the AMANDA COTS product; (2) the change in vendor personnel that hindered configuration and support; (3) insufficient testing of automated email batches; (4) issues with real-time email notifications to customers; (5) problems with the development of territory management reporting for inspectors; and (6) lack of integration with third-party inspection information.

Even though the department initially requested spending authority to purchase a "software-as-a-service" (SaaS) solution, the department will actually be seeking a "platform-as-a-service" (PaaS) solution, which will be customizable. SaaS solutions provide customers with the ability to run applications from a web browser, whereas PaaS solutions provide developers and administrators a framework to build upon when developing and customizing applications. PaaS solutions often make development, testing, and deployment of applications quick, simple, and cost-effective. With a PaaS solution, the vendor maintains the servers, virtualization, storage, networking, and the software itself.

SaaS and PaaS are both technical models in which a third party provider hosts applications or platforms and makes them available to customers over the internet. Organizations benefit from these cloud solutions by permitting a third party, whose core competency is the technical solution, to maintain and upgrade the solution. Maintenance provided by the vendor usually includes disaster recovery and cybersecurity. Some examples of cloud service providers (CSPs) include Amazon Web Services, Microsoft Cloud, and Salesforce.

A security breach of a CSP can lead to “hyperjacking”, or maliciously hacking a virtual environment that may impact many customers. Some examples of CSP data breaches include:

- a hacker putting a company out of business by deleting the company’s data and backups;
- sensitive and personal information stored on the cloud service being exposed to unauthorized parties; and
- a security breach that compromises user passwords.

CSPs face the same threats as traditional environments; however, the larger amount of data stored at a CSP may make it an attractive target. Additionally, depending on the type of solution provided, such as a PaaS or SaaS, the security responsibility may be shared between the vendor and the state (i.e., confidentiality, integrity, and availability). As a result, the solicitation should include a thorough evaluation of the CSP’s security policy, procedures, and certifications regarding the CSP’s compliance with state security standards.

The department says it has been working with OIT’s Chief Information Security Office (CISO) on the project and plans to continue complying with CISO’s best practices and standards. Additionally, OIT says that the Salesforce environment has been reviewed and approved by CISO.

**Solicitation type.** According to the Colorado procurement code, a competitive sealed bid should be published for goods or services over \$150,000. A competitive, sealed bid can either be through an invitation for bid, if the selection is primarily price-driven, or a request for proposals (RFP). The department says it plans to publish an RFP; however, OIT has already conducted a solicitation and awarded a price agreement to Salesforce for use by the state. As a result, the department will be procuring licenses through OIT as needed.

To design, customize, and implement the department’s Salesforce application, the department plans to use OIT’s implementers enterprise agreement (IEA), consisting of 16 vendors who are sourced per the Procurement Code and already under contract, thereby giving departments the ability to obtain real-time pricing via an informal quote process. The department creates a statement of work (SOW), and vendors review the SOW and respond based on need and price. Instead of issuing an RFP and awarding a contract, departments can use the task order process since OIT has master contract agreements already in place. This reduces the time required to obtain a vendor and cost savings are realized through competition between the IEA vendors.

**Initial research.** The department says that CDLE conducted a Salesforce Readiness Assessment (SRA) with OIT against all CDLE applications. Although AMANDA was not used as a benchmark, the SRA considered requirements, such as workflow, accessibility in the field, real-time data, automatic uploads, and web-based opportunities. The department is also leveraging experience from the Explosives program’s Salesforce pilot and a Salesforce implementation in the Unemployment Insurance division. Additionally, the department says that the Boiler Inspection program reached out to many other state programs for possible solutions

for the Conveyance program. Finally, the department has received OIT recommendations to use Salesforce for the replacement of the existing AMANDA system.

**Disaster recovery.** The department included a line item for disaster recovery for \$5,000 in the operating budget request. Typically, CSPs provide disaster recovery through the cost of service. Salesforce is a subscription license-based solution that includes real-time failover, disaster recovery, operations and maintenance, and incident and bug management. The department stated that there is no accurate way to itemize the cost for disaster recovery.

**Equipment costs.** The department included a line item for equipment costs (i.e., read-only-memory, server, hosting, and storage) for \$19,000 in the budget request. Typically, CSPs provide this infrastructure. The department explains that OPS intends to develop a public portal that may be hosted outside of the Salesforce solution.

**Training.** One advantage of having a cross-department technical platform, such as Salesforce, is the ability to share technical resources across departments. For example, an OIT Salesforce technical resource could maintain Salesforce applications for more than one department. The department included a line item for training OIT and program staff for \$15,000 in the budget request. The department says that the OIT technical staff it wants to train already work at CDLE. CDLE program staff will be trained because they will be Salesforce administrators.

**Contingency budget.** The department says it is confident with its budget estimates, based on the Salesforce Assessment and its previous Salesforce experiences. Even so, the department could consider adding a contingency because of potential data integrity issues with the migration of AMANDA data into the Salesforce solution. However, the department believes AMANDA may not have data integrity issues within the database.

**AMANDA go-live date.** The department says it engaged the vendor to build and configure the AMANDA database six years ago. The initial security scan of the AMANDA system was conducted before the system went live in 2013. Hence, AMANDA has been operational for approximately 3 years and 3 months for the Conveyance program.

## **JTC Staff Analysis**

The department has partnered with OIT during its research and plans to continue working with OIT by complying with OIT's project gating methodology. This includes complying with OIT's CISO security requirements. The department has also contacted other departments who have implemented Salesforce and it has leveraged the research conducted by the Boiler Inspection program.

According to the OIT, the state has approximately 63 existing Salesforce implementations at 17 departments. The department will be leveraging a Salesforce PaaS solution that has been implemented at other departments and will use the lessons learned from the AMANDA project.

After clarifying these issues with the department, JTC staff believes CDLE has adhered to best practices and standards in identifying technical specifications for the new software system to replace AMANDA.