

# LEGISLATIVE AUDIT DIVISION

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## MEMORANDUM

**TO:** Legislative Audit Committee Members

**FROM:** Tyler J. Julian, Associate Information Systems Auditor

**CC:** Department of Revenue  
Brendan Beatty, Director  
Scott Mendenhall, Deputy Director  
Kory Hofland, Division Administrator, Property Assessment Division  
Margaret Kauska, Chief Security Officer  
Manual Soto, Chief Information Officer, Technology Services Division

**DATE:** October 2021

**RE:** Information Systems Audit Follow-Up (21SP-23): *Data Security and Operational Performance of Montana's Computer-Assisted Mass Appraisal and Tax System (Orion)* (orig. 19DP-03)

**ATTACHMENTS:** Original Information Systems Audit Summary

### Introduction

The *Data Security and Operational Performance of Montana's Computer-Assisted Mass Appraisal and Tax System (Orion)* (19DP-03) report was issued to the Legislative Audit Committee in April 2020. The audit included eight recommendations to the Department of Revenue (DOR). In July 2021, we conducted follow-up work to assess implementation of the report recommendations. This memorandum summarizes the results of our follow-up work.

### **Overview**

The Department of Revenue (DOR) uses its Orion computer system to manage the data for property appraisals, calculations of assessed values, and determination of county certified values necessary for levying property taxes. The audit reviewed Orion's performance and security regarding protection of taxpayer data. Audit work identified that Orion data needs to be better protected to avoid manipulation of property values and leakage of confidential information. Orion performance also needs to be defined and monitored to reduce daily interruptions which affect the timeliness of the property appraisal process. Overall, our follow-up work indicated that DOR is making positive progress toward implementing the recommendations. The audit contained eight recommendations, seven that are still being implemented and one that is partially implemented.

### Background

The Property Assessment Division (PAD) within DOR manages the assessments of all Montana property. Section 15-1-201(1)(a), MCA, requires assessed values be "relatively just and equal, at true value, and in substantial compliance with law." Orion is the system that stores all current and historical Montana property data, manages property tax procedures, and determines various types of values for each piece of property. Orion also provides property data and assessed values to the counties, so counties can use this information to create tax bills.

Over 250 DOR staff in Helena, regional, and area offices use Orion in the performance of their duties. Orion has gathered hundreds of millions of data points since 2008 for over 977,000 properties. The property taxes collected based on the appraisals housed in Orion account for approximately 11 percent of all state revenue. As the complexity of laws and number of properties and users of the Orion system grows, so do potential issues within the system. We evaluated Orion data management, access management, data protection, system performance, and data validity and consistency.

### **Audit Follow-up Results**

Follow-up work included discussion with DOR staff and pertinent document review. Implementing recommendations from the audit were assigned to multiple DOR staff and two teams were created—one for the development of Service-Level Agreements and one for the analysis and improvement of system performance, data integrity, and tools used in conjunction with the Orion.

Performance degradation, security issues, and data inconsistencies associated with such a large system, if not managed, are bound to grow over time. Properly addressing these issues take additional work and time. Due to this, the agency is still implementing these recommendations. They are working to establish baseline performance expectations for Orion and developing service-level agreements to hold State Information Technology Services Division (SITSD) and the Orion contractor accountable for performance. They are also working to improve Orion's security and better protect the taxpayer data stored within the system, as well as identify and address data inconsistencies within the system.

### **RECOMMENDATION #1**

**We recommend the Department of Revenue establish objective baseline expectations for Orion performance.**

### ***Implementation Status – Being Implemented***

Our initial audit work identified that Orion's decreased performance is an ongoing concern and the lack of a performance baseline has lowered users' expectations of the system. Slow system response time during querying and reporting creates lost productivity and user frustration. Established baseline performance expectations will help DOR identify areas of the system that need improvement and focus their efforts. As a part of follow-up audit work, DOR indicated that they created evaluation measures to test current system performance time to complete a set of eight prescribed tasks. The connections to the Orion system are being tested in three different counties through both remote and direct connections. The goal for these tests was to determine the standard time to complete these tasks and whether the type of connection affect these times. The first round of testing was completed by June 15, 2021. The direct connection performed significantly better for most tasks (especially access and loading) and marginally slower for the remaining tasks. DOR stated that direct connections to the system require more bandwidth and might not be plausible for some rural field offices. As a result of the first round of testing, SITSD has increased memory and made configuration changes to the servers that govern the Citrix connection. DOR has completed a second round of testing and is compiling the results. Based on these results, DOR will define baseline performance expectations and determine the type of connection to be used by the different field offices. DOR intends to have baseline performance expectations established by January 01, 2022, at the latest.

### **RECOMMENDATION #2**

**We recommend the Department of Revenue:**

- A. Assign a team to manage and lead the service-level agreement on an ongoing basis.**
- B. Work with the vendor, Technical Services Division, and State Information Technology Services Division to create agency agreements or service-level agreements for Orion's performance.**

**C. Develop a formal and documented process to ensure ongoing communication occurs between all service-level agreement parties to hold them accountable to their service-level agreement baseline.**

**Implementation Status – *Being Implemented***

Our initial audit work identified that leadership to coordinate and improve Orion’s performance does not exist and responsibilities for maintaining performance are not defined. Without service commitments to maintain a performance baseline, Orion’s performance will continue to degrade. A service-level agreement (SLA) would help identify the source and the party responsible for performance when performance problems arise. Since the audit, DOR has created a team consisting of staff from the Property Assessment Division (PAD), the Technology Services Division (TSD), the State Information Technology Services Division (SITSD), and the vendor. The team has been meeting virtually since December 2020 to discuss what they would like included in the SLAs.

DOR has approached SITSD with a preliminary SLA based on the needs from supporting field offices. SITSD has requested a Memo of Understanding (MOU) be used to define the services provided. While it is unclear how this MOU will assist DOR implement the recommendation, we encourage DOR to work with SITSD to better define SITSD’s roles and responsibilities in supporting the performance of Orion. After an agreement with SITSD is complete, DOR will begin drafting the vendor SLA to improve and maintain overall system performance. DOR states that progress on both agreements is going as planned and they intend to put them into effect by the end of fiscal year 2022.

**RECOMMENDATION #3**

**We recommend the Department of Revenue develop a formal process to manage the use of the query and analysis tool that includes:**

- A. Ongoing monitoring of query and analysis tool to improve training and quality assurance.**
- B. Addressing security risks to mitigate data leakage.**
- C. Developing queries in a controlled and structured manner to avoid impacts to performance.**
- D. Managing and storing queried information from Orion databases to maintain data security.**

**Implementation Status – *Being Implemented***

Our initial audit work identified risks associated with the query and analysis tool used to extract data from Orion. Untested and inefficient queries could potentially bring the entire system to a halt, unmonitored access could lead to data being stolen from the system, and users running different versions of the same query could lead to inconsistent data in the system. A process to manage the use of the query and analysis tool would mitigate these risks. Since the audit, DOR has created a user group to manage and improve the use of the query and analysis tool. The focus of the group is to monitor the tool’s usage for performance and quality assurance, address security risks, and manage queries and other tasks to improve system performance.

One of the goals of the group is to identify poorly performing queries and improve them. The group is working to develop a unified set of queries and reports to minimize the use of modified or custom queries. The DOR intends to create statewide training for the unified queries. These unified queries will enforce query performance among all field offices and provide an overall improvement to the quality and consistency of the data being generated.

The group has also scheduled queries that require a large amount of resources to run when the system is not actively being used. They have also developed pre-queried data ahead of multiple users needing the information. The prepared information prevents multiple users querying new data first thing in the morning and bringing the system to a crawl. With pre-queried data, the incoming requests draw from prepared data and doesn’t require additional processing from the system.

The query and analysis tool allow users to query data anonymously creating the opportunity for data theft—this risk has not yet been addressed. DOR is working with various solutions to address the problem, however, hasn't formalized a consistent process to do so. Upgrades are being made to the tool's server and client environment which should identify which queries are run by specific users. Until queries can be associated with a user, the threat of data leakage remains. The DOR does not have a planned date to implement this recommendation but intends to keep working toward implementation.

#### **RECOMMENDATION #4**

**We recommend the Department of Revenue develop, implement, and follow a security plan with annual revisions that include:**

- A. Reviewing what confidential information needs to be stored within Orion and subsystems.**
- B. Performing a data classification review of existing data and file storage for proper classification.**
- C. Creating controls to limit user access to confidential data.**
- D. Formally monitoring access logs, user activity, and data/file removal.**

#### **Implementation Status – *Being Implemented***

Our initial audit work identified that confidential information stored within Orion is not classified and adequately controlled. Excessive access to high- and medium-security data could lead to intentional or accidental modification or deletion of data. These activities could affect property taxes and the public's perceptions of the State's ability to protect private information. A security plan that classifies confidential data and controls how that data is accessed helps mitigate the risk of exposing private information. Since the audit, DOR has identified and classified what types of taxpayer data (deemed confidential per Montana statutes) is stored within Orion. DOR can identify, tag, and index confidential data now with the use of additional monitoring software. The software also monitors and controls all access to confidential files at the user level. Further user and file activity are logged and monitored as well—even authorized access to confidential data. If DOR detects suspicious activity, this software is a tool to investigate a user and their actions.

A system security plan is being built. DOR is in the early stages of developing the steps that feed into the Plan of Action and Milestones, to generate the System Security Plan. DOR is working with SITSD to determine the boundaries of the system—where DOR can enforce their security rules, and where that authority ends. While getting the security plan finished is a priority, progress has been slow due to resource constraints. DOR plans to have the System Security Plan implemented by March 2022.

#### **RECOMMENDATION #5**

**We recommend the Department of Revenue coordinate Orion access management procedures with the department Security Office to ensure:**

- A. Defined, documented procedures are developed and used for approving changing and removing access within Orion, its support systems, and its related folders and files.**
- B. A security matrix exists of user roles and responsibilities that defines separation of duties and least privilege within Orion, its subsystems, and file storage.**
- C. Contractor access is limited and monitored.**

#### **Implementation Status – *Partially Implemented***

Our initial audit work identified that access management responsibilities for Orion are unclear. Lack of user access management can lead to security risks such as ghost accounts, vendors with administrative access, and employees retaining access after termination. Consistent monitoring and review of user access mitigate these risks. Since the audit, DOR has updated the Managing Information Security Systems Access Procedure that governs all DOR systems. This procedure outlines the creation of a new DOR user and how access is assigned in the system. The process to grant user access and assign a role in Orion has

also been updated to include a log of access and role changes, which manager requested the change and the Security Office must approve these changes.

Roles have been adjusted so that access rights are now explicitly assigned based on a user's position. Positions that do not need access to confidential data are not granted confidential access. Similarly, appraisers are not granted access to data outside of their district. A separation of duty has been introduced in the access request, approval, and assignment process. Assigning access now has an audit trail and PAD manager analysts review the roles and rights to ensure that the access is appropriate. With the recent changes to the access rights, a security matrix for the roles and responsibilities has not yet been created.

Contractor access is now controlled in the same manner as DOR employee access and must undergo the same request and approval process. An individual account is assigned to each contractor and must follow the State's password policy and use two-factor authentication. Access is granted for one to three days and can only be used between 10AM and 5PM. Access must be subsequently requested after expiration. While contractor access is server access and is not governed by role restrictions, DOR has database change monitoring enabled and are notified when an unexpected change occurs.

#### **RECOMMENDATION #6**

**We recommend the Department of Revenue:**

- A. Eliminate unsecured shared accounts, and**
- B. Encrypt user credentials and documents when shared accounts are used and by whom until these unsecure shared accounts can be eliminated.**

#### ***Implementation Status – Being Implemented***

Our initial audit work identified that two unsecured shared accounts pose a substantial risk to Orion. One account has administrative control of the Orion application and the other has privileged access to the database. Use of either of these accounts is difficult, if not impossible, to track, and malicious use could severely affect Orion. Elimination or securing access to these accounts is critical to protecting the Orion system. Elimination of the administrator account is not possible but the DOR is making changes to eliminate the usage of the account. Contractor development staff that require administrator access are assigned unique accounts that follow the State's security policy and use two-factor authentication. DOR will also be requesting the contractor provide user IDs to the security log so that administrator access can be further monitored.

The account used to access the database still exists as it did at the time of the audit. The contractor has recently provided DOR with a means to properly store the credentials. As of writing this memo, DOR is testing this solution in the Orion test environment. If the solution works in the test environment, the fix will be immediately implemented in the production environment.

#### **RECOMMENDATION #7**

**We recommend the Department of Revenue establish statewide quality procedures that:**

- A. Review system field usage to identify user errors and inconsistencies.**
- B. Monitor error logs to identify system errors and training issues**
- C. Connect causes to address potential system issues or common user error.**

#### ***Implementation Status – Being Implemented***

Our initial audit work identified that the usage of some data stored within the Orion system is inconsistent between regions. Orion is used to manage statewide parcel data and produce assessments and market values based on sales data from similar properties. Inconsistent system usage leads to property owners either paying too much or not enough property taxes in different regions. Coordinated statewide quality procedures would help mitigate this variance and ensure that Montana's property assessments are

relatively just and equal. DOR has recently hired a business analyst responsible for identifying user errors and inconsistencies in field usage—the business analyst described this as a learning and discovery process but has identified instances of varied field usage among different regions. The inconsistencies were related to unclear trainings and the existing trainings were updated to address sources of confusion. Since the release of the new trainings, there has been some decrease in recurrence of these errors.

The business analyst works closely with the Computer-Assisted Mass Appraisal (CAMA) unit to investigate various unique errors. When potential causes are identified, they are added to the Quality Assurance (QA) query list and further instances of the error are monitored and corrected. The intention is not only to correct existing errors in the data but to bring attention to the source of these errors and prevent them in the future (and prevent incorrect data from processing). Due to the ongoing nature of the monitoring and review work associated with this recommendation, there is not a set date for implementation; however, DOR is actively working towards implementation.

### **RECOMMENDATION #8**

**We recommend the Department of Revenue:**

- A. Coordinate targeted training across the state based on Orion use and issues.**
- B. Incorporate Orion log data and quality assurance programs into training development.**

### ***Implementation Status – Being Implemented***

Our initial audit work identified that PAD users felt training on the Orion system is inadequate. Training issues contribute to inconsistent data entry and report usage by staff across the different field offices. Changes to the system creates frustration and confusion among PAD users and increase instances of errors and inconsistent field usage. Targeted training and statewide quality assurance programs would ensure more uniform data entry and reporting among the different regions and field offices, as well as eliminate frustration and confusion related to system changes. Since the audit, DOR has updated the Property Assessment Division's Appraiser guide and made it available to all PAD staff. The business analyst has been working with the CAMA unit and has identified some inconsistencies among regions. However, DOR is still in the early stages of error monitoring so region specific trainings have not yet been created.

DOR states that Orion log data has been useful in identifying offices where multiple users are making the same mistakes. These errors are added to the QA query list and are monitored. DOR states that awareness of these queries seems to be reducing instances of repeat errors. DOR is unifying queries across the offices so that there isn't a duplication of effort and less chances to introduce errors and inconsistencies. They are also getting basic query analysis tool functionality into Excel so that uniform services are available to offices that do not have access to or use this tool. Due to the ongoing nature of this recommendation, there is not a set date for implementation; however, DOR is actively working towards implementation.