



MNLARS Quarterly Report Verification – Outages and System Slowdowns

November 2018

Financial Audit Division

OFFICE OF THE LEGISLATIVE AUDITOR
STATE OF MINNESOTA

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OFFICE OF THE LEGISLATIVE AUDITOR

STATE OF MINNESOTA • James Nobles, Legislative Auditor

November 20, 2018

Members of the MNLARS Steering Committee

Members of the Legislative Audit Commission

Mona Dohman, Commissioner
Minnesota Department of Public Safety

Johanna Clyborne, Commissioner
Minnesota IT Services

This report assesses the Minnesota Licensing and Registration System (MNLARS) performance measures and plans relevant to system outages and slowdowns, as required by *Laws of Minnesota* 2018, Chapter 101.

The audit objective was to assess the accuracy and completeness of select information reported by the Department of Public Safety and Minnesota IT Services in their April 2018, June 2018, and September 2018 MNLARS Quarterly Update reports.

Mark Mathison, IT Audit Director, conducted this audit. We received the full cooperation of the departments' staff while performing this audit.

Sincerely,

Judy Randall
Deputy Legislative Auditor



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Report Summary

The Office of the Legislative Auditor (OLA) has completed its first information technology audit of the Minnesota Licensing and Registration System (MNLARS) quarterly performance measures, as required by *Laws of Minnesota* 2018, Chapter 101.¹

The scope of this audit included an assessment of select performance measures reported by the Department of Public Safety (DPS) and Minnesota IT Services (MNIT) in their April 2018, June 2018, and September 2018 MNLARS Quarterly Update reports. Specifically, OLA examined performance measure six, titled *System Performance Including Slowdowns, Outages, or Other Performance Issues*. OLA also examined the incident communication plan, called *Plan for Communications for Transparent MNLARS Outages and System Slowdowns*. The audit objective was to assess the accuracy and completeness of the information reported to the Legislature.

Conclusions

- The Department of Public Safety and Minnesota IT Services accurately reported, in all material respects, system slowdowns, outages, and other performance issues in the MNLARS Quarterly Update reports for April 2018, June 2018, and September 2018.
- The Department of Public Safety and Minnesota IT Services materially complied with provisions of the law that required them to develop and implement a communication plan for transparent reporting of any MNLARS system performance issues.

Findings

We identified four findings and recommendations for the agencies and MNLARS Steering Committee to consider when analyzing these and future quarterly reports.

Finding 1. The Department of Public Safety and Minnesota IT Services misreported a small number of system outages.

Finding 2. The Department of Public Safety and Minnesota IT Services have not clarified system availability expectations with their stakeholders.

Finding 3. The Department of Public Safety and Minnesota IT Services did not report system performance statistics for all stakeholders.

Finding 4. The Department of Public Safety's and Minnesota IT Services' monitoring tools do not measure all end-user outages.

¹ In this report, OLA uses the term MNLARS to refer to the State of Minnesota's comprehensive information system and its subsystem components used to provide driver and motor vehicle licensing and registration services to Minnesota citizens.



Audit Overview

This report is the first by the Office of the Legislative Auditor (OLA) in response to a 2018 law that requires OLA to assess the Minnesota Licensing and Registration System (MNLARS).²

The law requires OLA to provide:

- A technical assessment of MNLARS.
- An assessment of the feasibility of the MNLARS project roadmaps and timelines.
- An assessment of estimated funding needs for the continued development, operations, and maintenance of MNLARS.
- An assessment of process changes and business workflows for auto dealers and deputy registrars.

Additionally, the law requires OLA to report on whether or not the commissioner of public safety and the state chief information officer are:

- Meeting predefined deadlines and performance measures.
- In compliance with specific plans required under the law.

This report focuses on performance measures and plans relevant to MNLARS outages and slowdowns, as defined within our audit scope and objective.

MNLARS Overview

The Minnesota Department of Public Safety (DPS) Driver and Vehicle Services Division (DVS) is responsible for MNLARS. DPS relies on MNLARS to process, transmit, and store a variety of driver and vehicle services transactions. In Fiscal Year 2018, MNLARS assisted the agency in collecting more than \$1.6 billion in driver- and vehicle-related taxes and fees. Minnesota IT Services (MNIT), the state's central information technology agency, is responsible for supporting the system.

MNLARS began as a multi-year project in 2008 to replace the state's aging mainframe license and registration systems. In October 2009, DPS hired a contractor, Mathtech, Inc., to assist with gathering business and technical

² *Laws of Minnesota* 2018, Chapter 101.

requirements. In April 2012, DPS subsequently contracted with Hewlett-Packard to develop the new system. In 2014, after implementing minimal functionality with the first release of MNLARS, DPS ended its contract with Hewlett-Packard. DPS then brought system development in-house, partnering with MNIT and a variety of contractors to finish the system.

In July 2017, DPS and MNIT rolled out the new motor vehicle registration components of MNLARS. With this launch, MNLARS encountered a variety of highly publicized business and technical problems.

By October 2017, DPS and MNIT determined that it was no longer practical to continue internal development of the driver's license components of MNLARS. In November 2017, the agencies contracted with Fast Enterprises, LLC to provide software and services to replace the state's outdated driver's license system. DPS, MNIT, and their vendor rolled out the new driver's license system components on October 1, 2018.

Throughout Minnesota, many entities and individuals other than DPS interact with MNLARS. Minnesota has 174 deputy registrar offices and 127 driver's license agents that use MNLARS to provide motor vehicle registration and licensing services. The DPS commissioner appoints counties, cities, or private individuals as deputy registrars and license agents to administer the state's motor vehicle and license laws. DPS also provides vehicle registration renewals directly through its online portal and mail-in service.

In addition to deputy registrars and license agents, other individuals rely on MNLARS. For example, auto dealers regularly interact with MNLARS to notify registrars of new vehicles held for resale and to transfer ownership of vehicle titles. Law enforcement officials also rely on MNLARS to review privileges and information of licensed drivers and vehicles. Exhibit 1 depicts how users benefit from the MNLARS system.

Exhibit 1: MNLARS Users and Business Purposes

Department of Public Safety, Deputy Registrars and Driver's License Agents

- To provide motor vehicle registration and licensing services

Auto Dealers

- To pre-register new vehicles and transfer ownership of vehicle titles

Law Enforcement

- To review privileges and information of licensed drivers
- To identify registered owners of vehicles
- To perform duties of a public defender and/or prosecutor
- To conduct investigations of tax, registration, and insurance fraud

Financial Lending Institutions

- To verify lienholder information on record

Metropolitan Council

- To verify and manage public transportation assistance programs

Minnesota State College System

- For public safety-related traffic and parking enforcement

Public Support Entities

- To enforce child support claims and court-ordered payments
- To administer social service programs

Tow Companies

- To notify owners and lien holders of impounded vehicles

Citizens

- For web-based transactions

SOURCE: Office of the Legislative Auditor.

Since the major system implementation in July 2017, MNLARS has been plagued with problems. System failures, process changes, and budgeting concerns have produced widespread frustration among citizens, legislators, deputy registrar offices, auto dealers, and other system users. In response, the Minnesota Legislature enacted laws that established a legislative oversight committee, required DPS and MNIT to report quarterly on system improvements, and required OLA assessments.³

At the time of our audit, DPS and MNIT had prepared three quarterly reports for the MNLARS Steering Committee. DPS and MNIT presented the first quarterly report to the committee on April 30, 2018. The agencies presented the second quarterly report on June 11, 2018. The third report was delivered to the committee on September 11, 2018.⁴

Audit Objective

The objective of this audit was to assess the accuracy and completeness of information reported by DPS and MNIT to the Legislature within the first three MNLARS quarterly update reports.

Specifically, the objective of this assessment was to answer the following questions:

- Did DPS and MNIT accurately report and make progress on MNLARS system performance issues, including system slowdowns, outages, or other performance issues?
- Did DPS and MNIT comply with provisions of the law that required them to develop a communication plan to report MNLARS system performance issues to relevant system stakeholders?

Audit Scope

The scope of this audit included an assessment of select performance measures reported by DPS and MNIT in their April 2018, June 2018, and September 2018 MNLARS Quarterly Update reports. Specifically, OLA examined performance measure six, titled *System Performance Including Slowdowns, Outages, or Other Performance Issues*. OLA also examined the incident communication plan, called *Plan for Communications for Transparent MNLARS Outages and System Slowdowns*. We evaluated relevant system performance and incident response internal controls as of September 2018.

³ *Laws of Minnesota* 2018, Chapter 101.

⁴ See <https://www.lcc.leg.mn/mnsc/meetings.html>, accessed September 14, 2018.

Our scope of system performance was limited to measurements within state-controlled networks and data centers. Actual performance results experienced by end-users outside of the MNIT-managed environment, such as at auto dealer and deputy registrar locations, could vary depending on network quality and other local technology implementations. To address those concerns, we have selected a sample of deputy registrar locations to visit and review during our next quarterly review.

Audit Methodology and Criteria

We conducted a variety of audit procedures to assess the accuracy and completeness of MNLARS quarterly report data. For our selected scope, we interviewed staff at DPS and MNIT to gain an understanding of relevant operational processes and procedures. We also compared those processes and procedures to industry best practices.⁵ Finally, on a sample basis, we analyzed system data and confirmed that the processes and procedures were working as intended.

Conclusions

We concluded that the Department of Public Safety and Minnesota IT Services accurately reported, in all material respects, vehicle system slowdowns and outages in the MNLARS Quarterly Update reports for April 2018, June 2018, and September 2018. Additionally, we determined that the departments materially complied with provisions of the law that required them to develop and implement a communication plan for transparent reporting of any MNLARS system performance issues.

We identified four findings and recommendations for the agencies and Legislature to consider. The following *Findings and Recommendations* section provides further explanation about instances of errors or omissions from the quarterly reports and additional best practice improvements.

⁵ As a basis to define industry best practices, we used COBIT Version 5 – Availability and Capacity Practices and Activities and the third version of the Information Technology Infrastructure Library (ITIL), which are both globally recognized collections of best practices for managing information technology.



Findings and Recommendations

DPS and MNIT reported MNLARS system slowdowns and outages in their three quarterly update reports. Exhibit 2 articulates which quarterly reports contain system availability and performance metrics for a specific month.

Exhibit 2: Monthly Availability Performance Reports

April 2018 MNLARS Quarterly Update Report	June 2018 MNLARS Quarterly Update Report	September 2018 MNLARS Quarterly Update Report
Contains availability statistics for: <ul style="list-style-type: none">JanuaryFebruaryMarch	Contains availability statistics for: <ul style="list-style-type: none">AprilMay	Contains availability statistics for: <ul style="list-style-type: none">JuneJulyAugust

SOURCE: Office of the Legislative Auditor, analysis of MNLARS Quarterly Update reports.

In each report, the agencies reported system performance statistics on four MNLARS system components, each of which provides different business functionality and are at different stages in the overall system lifecycle. Exhibit 3 summarizes the four MNLARS system components.

Each MNLARS system component is independent of the other, such that MNLARS—the overarching system—may be running and available, yet one system component may be experiencing an outage. The outage would affect system users only if they try processing a transaction needing the unavailable component.

Exhibit 3: System Components with Reported Availability Statistics

License and Registration System Components			
Mainframe	ESupport	DVS Permits	MNLARS
<ul style="list-style-type: none"> The central computing environment for system functionality that DPS and MNIT have not yet modernized into the new MNLARS environment. The mainframe environment is outdated and will be decommissioned as additional functionality is added to MNLARS. 	<ul style="list-style-type: none"> Provides users with a web-based browser interface to older system components and functionality not yet built into MNLARS. Developed in 2001, this outdated environment will be decommissioned as additional functionality is added to MNLARS. 	<ul style="list-style-type: none"> Used to issue vehicle permits to qualifying customers that are required to use Minnesota roads with special conditions, for a specific limited duration, and/or where the standard registration does not apply. First MNLARS component released in 2014. 	<ul style="list-style-type: none"> Includes modernized system hardware and business functionality. This component currently includes new inventory, finance, and motor vehicle title and registration functionality. Released in July 2017, this component is the basis for additional functionality.

SOURCE: Office of the Legislative Auditor.

FINDING 1

The Department of Public Safety and Minnesota IT Services misreported a small number of system outages.

DPS and MNIT excluded from their quarterly performance reports five instances when the system was not properly functioning. These five instances accounted for over nine hours in which certain MNLARS system functions were not running and available during normal business hours. The excluded instances included:

- System users were not able to complete some licensing transactions for over seven hours on April 26 and 27, 2018, due to a nationwide outage of the National Driver Registry.⁶
- System users were unable to process some motor vehicle transactions for approximately one hour on June 1, 2018.
- System users were not able to log into the system for approximately 15 minutes on June 4, 2018.
- System users were not able to complete some licensing transactions for over one hour on August 6, 2018, due to an issue with the national Commercial Driver's License Information System.⁷
- System users were not able to process some driver's license transactions for 10 minutes on August 17, 2018.

⁶ The American Association of Motor Vehicle Administrators operates both the National Driver Registry and the Commercial Driver's License Information System. These national systems connect motor vehicle agencies across the United States to services to help verify identity, license, and vehicle information. Neither DPS nor MNIT can fix outages of these systems.

⁷ *Ibid.*

The agencies also misreported 85 minutes of system outages for July 2018 for the DVS Permits component; no outages occurred during the month of July. DPS and MNIT erroneously re-reported June outages for July.

We confirmed that DPS and MNIT leaders were aware of the five unreported outages and that they followed standard incident management processes. Agency staff attributed the errors in the legislative reports to clerical and administrative oversights.

Exhibit 4 shows OLA’s estimated system availability compared to what DPS and MNIT reported for system availability during the months of April, June, July, and August 2018.

Exhibit 4: Summary of MNLARS Misreported Performance Issues in Quarterly Reports

Month	System Component	DPS/MNIT Reported Slowdowns and Outages	Misreported Slowdowns and Outages	DPS/MNIT Reported Availability	OLA Estimated Availability
April 2018	ESupport	0.13 hours	7.16 hours underreported	99.96%	97.7%
June 2018	MNLARS	3.55 hours	1.25 hours underreported	98.87%	98.5%
July 2018	DVS Permits	1.43 hours	1.43 hours overreported	99.57%	100.0%
August 2018	ESupport	0.00 hours	1.43 hours underreported	100.00%	99.6%

SOURCE: Office of the Legislative Auditor, analysis of MNLARS performance data.

RECOMMENDATION

DPS and MNIT should ensure that outage data they provide to the Legislature is accurate and complete.

FINDING 2

The Department of Public Safety and Minnesota IT Services have not clarified system availability expectations with their stakeholders.

Industry best practices recommend comparing actual availability statistics to agreed-upon stakeholder expectations. However, the statistics in the MNLARS quarterly reports only represent what has occurred; the reports do not also present expectations.

DPS and MNIT report system availability as a percentage, using a formula of agreed service time less actual unplanned downtime during the agreed service time, divided by the agreed service time. Achieving 100 percent availability is often considered theoretically impossible. For this reason, it is critical for DPS, MNIT, and other stakeholders to agree upon acceptable rates of availability. This “agreement” is often documented in a service level agreement. The service level agreement should contain both agreed service times and acceptable unplanned downtime.

Calculating Availability

$$\text{Availability} = \frac{(\text{AST} - \text{DT})}{\text{AST}} \times 100$$

AST = Agreed service time

DT = Unplanned slow or downtime

The Department of Public Safety and Minnesota IT Services reported system availability criteria that conflict with, or are not included within, service level agreements.

For their quarterly reporting, DPS and MNIT calculated system availability using business hours from 6:00 a.m. to 9:00 p.m., five days per week. However, the service level agreement between DPS and MNIT set the expectation of availability for these services as a ten-hour period from 7:00 a.m. to 5:00 p.m., six days per week. This difference in service time can create confusion and a false expectation of system availability for system users. For example, an information technician may be slower to respond to an outage at 8:30 p.m., assuming the functionality is not needed, yet an auto dealer may be relying on the system to finalize a transaction.

While a service level agreement between DPS and MNIT sets the expectation of availability, we did not see evidence that DPS has effectively communicated hours of service time or estimated unplanned downtime with deputy registrars, auto dealers, or other stakeholders. The current service level agreement between DPS and MNIT targets annual availability at 99.7 percent. This equates to DPS and MNIT agreeing on acceptable downtime during business hours of 10 to 15 hours per year. If this acceptable downtime is not known or agreed upon by key system stakeholders, expectations could be misaligned.

The service level agreement between DPS and MNIT may not be achievable.

The service level agreement between DPS and MNIT targets annual availability at 99.7 percent. However, the success of many MNLARS transactions is heavily dependent on a variety of contracted services, including those operated by the American Association of Motor Vehicle Administrators. These vendor-provided components of MNLARS only have a targeted availability of 99.5 percent.⁸ A system cannot achieve performance greater than the weakest of its subcomponents. This difference in targeted availability could create disagreement among stakeholders on whether or not MNLARS is meeting expectations.

Service level agreements between the Department of Public Safety and Minnesota IT Services are not current.

DPS and MNIT have not formally agreed upon service level expectations since July 2012. MNLARS and agency management have undergone significant changes since that time. To ensure that MNIT and DPS each understand service level expectations, the agencies should have a more current agreement. MNIT and DPS have drafted a new service level agreement; however, because the agencies have not finalized the agreement, many essential MNIT and DPS staff were unaware of the system availability expectations.

RECOMMENDATION

DPS and MNIT should formalize and update service level expectations.

FINDING 3**The Department of Public Safety and Minnesota IT Services did not report system performance statistics for all stakeholders.**

MNLARS stakeholders have a variety of system availability needs. Deputy registrars and auto dealers need the system to be available during normal business hours. However, MNLARS needs to be available 24 hours per day, seven days per week, for law enforcement and citizen-facing Internet services.

In their quarterly reports, DPS and MNIT reported system availability statistics from 6:00 a.m. to 9:00 p.m., five days per week. These availability metrics addressed most of the needs of deputy registrars and auto dealers. However, the agencies did not report system availability statistics for the needs of law enforcement and citizens that use web-based functionality.

⁸ See <https://www.aamva.org/tech-services/>, accessed September 6, 2018.

DPS and MNIT do provide 24-hour support for law enforcement and citizen web-based functionality. We are not aware of any substantial availability or performance issues between the hours of 9:00 p.m. and 6:00 a.m. that would have drastically changed the statistics that DPS and MNIT reported in their three quarterly update reports. However, we believe a separate metric that provides information on 24-hour availability may be useful to measure whether the agencies are meeting expectations for the needs of law enforcement and citizens that use web-based functionality.

RECOMMENDATION

DPS and MNIT should track and report performance metrics for each service level expectation.

FINDING 4

The Department of Public Safety's and Minnesota IT Services' monitoring tools do not measure all end-user outages.

DPS and MNIT only monitored system performance within state-controlled networks and data centers. Technical issues that occur outside of these state-controlled networks and data centers can impact the ability to process MNLARS transactions. However, DPS and MNIT did not have tools to identify and assess the impact of those issues, which often occur within deputy registrar offices.

DPS and MNIT recognized the limitations of their monitoring tools and are exploring solutions that can provide better end-user monitoring. The agencies may not be able to resolve technical issues that occur within deputy registrar offices. However, system availability data that extends to local offices will help the agencies determine whether technical problems are localized or widespread.

RECOMMENDATION

DPS and MNIT should continue their evaluation of better monitoring tools and put them into operation as warranted.

November 18, 2018

Judy Randall, Deputy Legislative Auditor
Office of the Legislative Auditor
Centennial Office Building
658 Cedar Street

Dear Ms. Randall,

Thank you to you and your staff for the work done to analyze the MNLARS Quarterly Reports, which are provided by the Minnesota Department of Public Safety and Minnesota IT Services to the MNLARS Steering Committee on a quarterly basis. A total of three reports have been submitted, each one focusing on overall vehicle system updates as well as reporting specifically on the seven performance measures laid out in statute. We concur with your team's conclusion that the performance measure reporting you analyzed was materially accurate and in compliance with the provisions of the law.

The MNLARS quarterly reports in fact measure the performance of four separate applications: DVS Permits, E-Support, Mainframe, and the new Motor Vehicle System commonly referred to as MNLARS. Performance information for all four applications are being included in the MNLARS reports because, taken together, these applications process all necessary driver and motor vehicle transactions. That said, for the purpose of assessing the performance of the MNLARS system itself, it is important to discern between those systems funded through the MNLARS initiative (DVS Permits and the MNLARS Motor Vehicle System) and legacy applications that pre-date the initiative (E-Support a.k.a. the "legacy driver system" and the Mainframe system).

As it relates to Finding #1, we feel it is important to clarify some context related to the report's statement that the agencies misreported "over nine hours in which certain MNLARS system functions were not running and available during normal business hours." Eight of the nine hours claimed in the report to be misreported MNLARS system function outages were in fact national vendor service outages that impacted the legacy driver system known as E-Support. This vendor outage had no impact on the MNLARS vehicle system or the ability of deputy registrar's to perform vehicle transactions for customers, however it did impact some driver's license transactions. Regarding the one-hour June 1 MNLARS outage and 15-minute log in issue that occurred on June 4, it was our intent to include these events in the June report, however they were missed due to a clerical error. We of course concur with the report's recommendation that DPS and MNIT should ensure that outage data they provide to the Legislature is accurate and complete. In that vein, we will be incorporating vendor service outages in quarterly reports moving forward, regardless of whether those outages affect deputy registrars' ability to process citizen transactions. Moreover, while much of the quarterly report production process is

manual in nature, we will also be working to identify further automation that can be added to the process, in order to mitigate any instances of clerical error.

As it relates to Finding #2, we agree with the recommendation that DPS and MNIT should formalize and update service level expectations. An updated service level agreement between DPS and MNIT is currently being finalized, as part of an enterprise-wide SLA refresh initiative involving all executive branch agencies. DPS and MNIT staff will work to ensure alignment of service expectations between MNIT-provided services and third-party vendor-provided services and will work to clearly communicate those service and availability expectations to MNLARS stakeholders.

On Finding #3, we concur with the recommendation that a separate metric should be provided going forward for 24-hour availability of the system for law enforcement use and online registration tab renewals. Such a metric will be incorporated in the upcoming December MNLARS Quarterly Report.

Finally, on Finding #4, we agree with the recommendation that DPS and MNIT should continue their evaluation of better monitoring tools. While current tools do not allow MNIT to detect all internet service outages or local events that may impact one of the 174 independent deputy registrar offices, new tools were installed in October of 2018 that are currently being configured and that will provide greater capability around end-user monitoring. Once fully configured, these tools will enable MNIT to detect when an individual deputy registrar office is experiencing internet connectivity challenges that prevent them from fully or efficiently accessing MNLARS and associated DVS systems. With registrar offices employing a range of internet service providers at varying bandwidth and speed, we are hopeful these tools will provide helpful information to assist deputy registrars in identifying solutions that will increase the efficiency of their work in MNLARS and other DVS systems.

We appreciate your efforts to validate and confirm the accuracy of MNLARS Quarterly Reports. We are committed to full transparency as it relates to system performance information provided to the MNLARS Steering Committee as set forth in state statutes. We look forward to working with your team as you evaluate other performance measures reported in subsequent quarterly reports.

Sincerely,



Johanna Clyborne
Commissioner and State Chief Information Officer
Minnesota IT Services



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