# MNLARS Quarterly Update

September 2018

MINNESOTA IT SERVICES

# Contents

# Executive summary

This document serves as the September 11, 2018 update provided by Minnesota IT Services (MNIT) and the Department of Public Safety (DPS) to the members of the Legislative Oversight Committee (LOC) on MNLARS. Each item in this document responds directly to the performance requirements defined by statute: Minnesota Laws 2018, Chapter 101. The quarterly update outlines MNLARS benchmarks, describes how those benchmarks have improved since the report submitted in June 2018, and details the work that continues to improve the system and the business processes that exist between the Department of Public Safety Driver and Vehicle Services division (DVS) and its business partners.

Since the last quarterly update, MNIT has deployed two successful releases of the system. Each provided additional functionality and performance improvements. The overall feedback MNIT and DPS has received from deputy registrars has been very positive.

### Release 1.12 update (release date: June 24, 2018)

Release 1.12 addressed a number of existing defects, improved system performance and provided improvements to several functionalities for both DVS staff and deputy registrars. The following functional improvements have been provided as a result of 1.12:

- Deputies are now able to manage their office closeouts with greater ease
- Improved processes for Non-Use and Quarter Registrations
- Reduced instances of pending cart transactions
- Reduced downtime for password re-entry if a user account is locked out

With the input and approval of the Executive Steering Committee (ESC), MNIT and DPS have refined some workarounds as progress is made to complete existing system gaps. An added measure to the regression testing process is in place to ensure all DVS approved workarounds are not effected by future releases. This additional testing was performed with release 1.13 and will continue to be in place for all future releases.

### Release 1.13 update (release date: July 22, 2018)

Release 1.13 provided deputy registrars the ability to process duplicate titles, and was released in time to meet the August 1, 2018 statutory deadline. In order to ensure MNIT and DPS do everything possible to prepare business partners for the coming changes, user acceptance testing (UAT) and training was provided. DVS has added 5 additional opportunities for deputy registrars to take training on processing duplicate titles. As a result, every deputy registrar office received some level of duplicate title training.

Duplicate title transactions have begun being processed and as of September 6, a total of 10,866 duplicate titles have been successfully processed by deputy registrars. Other transactions were added to 1.13 including the $2 organ donation fee and the Expedited Title fee.

### Upcoming Releases 1.14 and 1.15

Having finished the feature and issue reprioritization process with the MNLARS ESC, MNIT and DPS have identified and communicated the content planned for the 1.14 and 1.15 releases to the ESC. These two releases deliver on nearly 50% of the stakeholders' top priorities. Identified items include a mix of defects, gaps and new features. MNIT will build 10 of the top 12 identified features into the system by early February 2019. After this release, a staffing ramp-down is planned. Copies of content planned for each of these releases will be available at the September 26th MNLARS Legislative Oversight Committee hearing.

### FAST contract restructure

As the chairs and other leadership of the MNLARS Legislative Oversight Committee have previously been made aware of, MNIT and DPS have begun negotiating a restructuring of the FAST contract to ensure the funding is available to continue making progress on the MNLARS Vehicle System. Current appropriations do not allow for both Phase 2 of the FAST Driver System and further releases in the MNLARS Vehicle System. Because releases 1.14 and 1.15 deliver on nearly 50% of priority items set by the MNLARS Executive Steering Committee, including the ability to transfer specialty plates, it is critical to ensure a ramp-down does not occur on MNLARS Vehicle System development prior to these releases being built in the system. This contract restructuring does not affect Phase I of the FAST Driver System, which provides all of the functionality necessary to process current driver's license transactions, applications for REAL ID, and additional features, such as Customer Pre-Application capabilities allowing citizens to complete information before visiting their local driver's license agency. This functionality will be available on October 1, 2018. The current contract between the state and FAST includes $15 million in deliverables and required payments in FY19 for the Driver system, while the current budget includes only $9.5M in FAST contract payments in FY19.

### Request to adjust appropriation riders

MN Laws 2018, ch. 101, sec. 1, subd. 4 allows DPS and MNIT to request adjustment of the funding amounts that were appropriated in FY18 for the MNLARS Vehicle System. A separate letter accompanying this report details a request to amend three riders. The request is to decrease two rider amounts where spending was lower than originally estimated, (1) user authentication and access control management and (2) contracted software review and software development support services, 3) Testing environment., hardware, server & data, and use the remaining funds from those riders to increase one rider amount, contracting to perform software development on the vehicle services system. This request would increase the contracting to perform software development rider by $93,000, which would support contractor costs associated with release 1.15. The specifics associated with this request can be found on page 33 in the special rider budget.

### Performance measures

Specific changes to the seven performance measures have been updated in the following areas:

- Performance measures #1 and #2: MNLARS gaps and defects (pg. 11)
- Performance measure #4: Reduction in vehicle title backlog (pg. 14)
- Performance measure #6: System performance (pg. 17)
- Performance measure #7: Customer service responsiveness (pg. 22)

## Key milestones

The key milestones detailed within this report are measured by the performance requirements outlined in Minnesota Laws 2018, Chapter 101, as follows:

- Subd. 2 (b) (1) - Extent to which MNLARS defects have been resolved
- Subd. 2 (b) (2) - Extent to which gaps have been resolved
- Subd. 2 (b) (3) - Improvements to edit transactions
- Subd. 2 (b) (4) - Reduction in backlog of vehicle titles
- Subd. 2 (b) (5) - Extent of errors in transactions – data fixes
- Subd. 2 (b) (6) - System performance
- Subd. 2 (b) (7) - Customer service responsiveness

## Governance

| MNLARS Executive Steering Committee (* = voting member) | | |
|---|---|---|
| **Massey Afzali*** Product Manager, BCA | **Amber Backhus*** MN Auto Dealers Association | **Dana Bailey** Director of Projects and Initiatives, MNIT |
| **Jeff Ball*** Project Consultant/Business Analyst | **Tami Bartholomew** Administrative Supervisor, DVS | **Rayah Barton*** Management Analyst |
| **Amanda Coppin*** Deputy Registrar, South Saint Paul (Member MDRA) | **Thomas DeVita*** Support Services Program Director | **Ash Durham** Project Architect |
| **Jim Forsell** Deputy Liaison Supervisor | **Tom Henderson*** Vehicle Services Program Director | **Scott Lambert*** MN Auto Dealers Association |
| **Laura Laudenbach*** Deputy Registar, Stearns County (Member MDRA) | **Al Lentsch*** Northland Independent Auto Dealer Association | **Neng Lor*** Deputy Registrar, Hennepin County (Member MDRA) |
| **Beckey Mechtel** MNLARS Communication | **Vic Moore*** Minnesota Auto Auctions | **Cassandra O'Hern** Deputy Commissioner, DPS |
| **Dawn Olson** Director, Driver and Vehicle Services, DVS | **Joan Redwing** Interim CBTO, DPS | **Deana Schweitzer*** Deputy Registrar, Prior Lake (Member MDRBOA) |
| **Denise Vogel*** Deputy Registrar, Morrison County (Member MDRA) | **Donny Vosen*** Deputy Registrar, Brainerd | **Mike Wright** Senior Manager of Operations, MNIT |

| MNLARS Project Management Team | | |
|---|---|---|
| **Dana Bailey** Director of Projects and Initiatives, MNIT | **Tami Bartholomew** Administrative Supervisor, DVS | **Rayah Barton** Management Analyst |
| **Thomas DeVita** Support Services Program Director | **Ash Durham** Project Architect | **Jim Forsell** Deputy Liaison Supervisor |
| **Tom Henderson** Vehicle Services Program Director | **Dawn Olson** Director, Driver and Vehicle Services, DVS | **Joan Redwing** Interim CBTO, DPS |
| **Jeff Schmitz** DVS Deputy Director | **Dawn VanRyn** Supervisor, Project Management Office, MNIT | **Mike Wright** Senior Manager of Operations, MNIT |
| **Laura Wakefield** Senior Project Manager | | |

| MNLARS Senior Leadership Team | | |
|---|---|---|
| **Dana Bailey**<br>Director of Projects and Initiatives, MNIT | **Jenna Covey**<br>Deputy Commissioner, MNIT | **Cambray Crozier**<br>Communications Director, MNIT |
| **Jon Eichten**<br>Legislative Director, MNIT | **Bruce Gordon**<br>Communications Director, DPS | **Cassandra O'Hern**<br>Deputy Commissioner, DPS |
| **Dawn Olson**<br>Director, Driver and Vehicle Services, DVS | **Joan Redwing**<br>Interim CBTO, DPS | **Kate Weeks**<br>Legislative Director, DPS |

| MNLARS Executive Leadership Team | | |
|---|---|---|
| **Dana Bailey**<br>Director of Projects and Initiatives, MNIT | **Johanna Clyborne**<br>Commissioner, MNIT | **Jenna Covey**<br>Deputy Commissioner, MNIT |
| **Mona Dohman**<br>Commissioner, DPS | **Cassandra O'Hern**<br>Deputy Commissioner, DPS | |

## Quarterly project status summary

MNIT and DPS have successfully deployed release 1.12 to improve end of day close and successfully deployed release 1.13 for duplicate title printing in support of the new statute effective August 1, 2018. MNIT continues project management efforts focused on releasing software based on stakeholder priorities, continues to update the project methodology and reporting, and continues to provide updates to the MNLARS system design, tools and software development standards**.**

| Release schedule | | Target deployment | Current status |
|---|---|---|---|
| 1.12 | Partial Electronic Vehicle Titling Registration, end of day close | Deployed June 2018 |  |
| 1.13 | Duplicate Title Printing | Deployed July 2018 |  |
| 1.14 | Majority of Top 5 Tiers of Master List Priorities – Apply for Corrected Title | Nov 2018 |  |
| 1.15 | Majority of Top 5 Tiers of Master List Priorities– Specialty Plate Transfer | Feb 2019 |  |

Key: **Green:** Project performing to plan; **Yellow:** Project viability is at risk; **Red:** Project requires corrective action

**Status of recent and upcoming releases:** Release 1.12 and 1.13 successfully launched in the summer of 2018. Release 1.12 improved office close out functionality for deputy registrars and included many fixes, making release 1.12 the largest release since the launch of MNLARS in July of 2017. Release 1.13, Duplicate Title Printing, was launched on July 22, 2018, and an average of 435 duplicate titles are now printed daily at deputy registrar locations. In addition to releases 1.12 and 1.13, there are two large releases in progress to be deployed for the MNLARS Vehicle System. Releases 1.14 and 1.15 address the majority of the top 5 tiers of ranked features and fixes requested by the Executive Steering Committee that include: apply for corrected title, specialty plate transfer, updates to EVTR, change of class, and change of class conversion, among many other items.

**Team staffing and ramp down, end of February 2019:** Currently, MNLARS Vehicle System development work is funded until February 28, 2019. At that time, all MNLARS Vehicle contractors will ramp down and MNLARS Vehicle will consist of a small team of state staff that will continue hosting and operating the system until the end of fiscal year 2019. Beyond fiscal year 2019, there is insufficient funding to continue operating the MNLARS Vehicle System. Depending on the result of the FAST contract negotiated restructuring, the FAST Driver System contract may also face a ramp down in February 2019.

**Continued MNLARS progress:** Given the ramp down in contractors planned for February 2019, the team will not be staffed to keep the fixes and new feature development progressing through the remainder of FY 2019. There are 138 items remaining on the master list – 46 gaps, 70 defects and 22 new feature requests that are not yet fully covered in the MNLARS Vehicle release plan. If additional funding is appropriated, MNIT will continue the MNLARS Vehicle effort from the end of February through the end of FY 2019. Maintaining the team avoids costs associated with ramping down, ramping back up and transitioning to a new team, versus continuing system improvements with an experienced team. As has been reflected in previous biennial budgets, there is not sufficient ongoing funding sources to support the maintenance of either the MNLARS Vehicle or FAST Driver Systems. DPS and MNIT plan to present funding options to the new governor's administration for consideration in the FY 20-21 biennial budget submission to the legislature. Funding must be secured to avoid impacting critical services upon which Minnesotans rely. The funding options will take into consideration possible alterations to the FAST contract as a result of restructuring the contract.

## MNLARS Vehicle development and implementation timeline

The primary focus of the MNLARS Vehicle project is to remediate high priority defects and gaps while delivering new features needed by deputy registrars, auto dealers, and other system stakeholders. Guided by stakeholder prioritization in the master list process, the project milestones below reflect a focus on delivering priority defects and gaps that MNIT and DPS anticipate can be completed with remaining funding. Additionally, the majority of all MNLARS Vehicle System maintenance and support funding ends in fiscal year 2019.

## Milestones

### Delivery deadlines

| Deadline | Milestones | Status |
|---|---|---|
| Q1 2018 | January 31, 2018 MNLARS Vehicle defects and gaps roadmap | Completed |
| Q2 2018 | Launch release 1.11.2 | Completed |
| Q2 2018 | Project re-charter with new project management and reporting | Completed |
| Q2 2018 | Re-score and refresh stakeholder priority list | Completed |
| Q2 2018 | Launch release 1.12 | Completed |
| Q3 2018 | Launch release 1.13 – Duplicate title printing | Completed |
| Q4 2018 | Launch release 1.14 – Apply for corrected title and majority of top 5 tiers gaps/defects/new feature priorities | In Progress |
| Q4 2018 | Transition to reduced staff support model (ramp-down) January 2019 | Not Started |
| Q1 2019 | Launch release 1.15 – Specialty plates and remaining majority of top 5 tier gaps/defects/new feature priorities | Not Started |
| Not funded beyond Feb 2019 | Deliver all defects/gaps/new features for stakeholders plus system workflow optimization required by system users | In Progress |
| Not funded beyond FY 2019 | Provide system operations, maintenance and support | In Progress |

## Additional roles staffing date milestones

Due to the absence of full funding to keep or recruit all of the private contractors needed to enhance the system, some of the planned system optimization and mainframe migration work has gone on hold. As you can see, there are a number of contractor positions that have been left unfilled. These positions are required to complete DVS, deputy registrar and dealer workflow optimizations needed for ultimate system acceptance. These positions are also necessary to complete the vehicle services modernization effort, but are not currently funded. The MNLARS Vehicle team's focus has shifted from completing the system modernization effort to resolving stakeholder priority defects and gaps before funding runs out. Further funding early in the next legislative session is required to ensure delivery of the final development phase to modernize the vehicle services system.

| Deadline | Milestones |
|---|---|
| Completed | (3) Quality control system analysts/product management analysts |
| Not funded | (1) UI designer/programmer for dealer, DVS and deputy registrar system workflow optimization |
| Not funded | (3) .NET programmers to replace remaining legacy applications |
| Not funded | (3) DBA/SQL developers for performance tuning entity framework and data corrections |
| Not funded | (2) Program manager/project manager – backfills for turnover |
| Not funded | (2) User experience redesign analysts for dealer, DVS and deputy registrar system workflow optimization |
| Not funded | (3) .NET development tech leads managing concurrent development work |
| Not funded | (2) Solution architects for technical oversight of parallel development – backfill for turnover |
| Not funded | (4) .Net developers for dealer, DVS and deputy registrar system workflow optimization |
| Not funded | (5) Mainframe migration programmers to migrate from remaining legacy applications |

## Legacy decommission deadlines

| Deadline | Milestones |
|---|---|
| TBD | Finance: Swift integration, accounting controls, reporting |
| TBD | Prorate / IRP / IFTA (commercial trucks) title and registration functions |
| TBD | Dealership licensure |
| TBD | HP permits legacy systems support – commercial permitting |
| TBD | Document imaging: Stellant |

# MNLARS Vehicle performance measures

## Performance measures #1 and #2: extent to which MNLARS Vehicle gaps and defects have been resolved

Two releases have launched successfully since the last report. Release 1.12 contained 84 items and release 1.13 contained 26 items. Release 1.12 was the largest MNLARS Vehicle release since the original product launch. It included editing functionality for liaisons, office close-out enhancements, and data fixes around inventory. Release 1.13 focused on duplicate title printing, fleet pre-bill and several defect fixes.

As of September 1, 2018: 138 defects, gaps, and new feature requests remain and have been ranked and prioritized for inclusion in future releases. This is down from 284 from the May 1 report.

Electronic Vehicle Title Registration (EVTR) code is scheduled for delivery over two releases in 1.12 and 1.14, and will then be integrated with the vendor software for a rollout starting in the first quarter of 2019 to dealers and registrars.

### Definitions:

- A **gap** refers to functionality that is required by the stakeholders, but has not yet been developed.
- A **defect** refers to existing functionality that is not working, or is incorrectly implemented.
- The **scale** of an individual gap or defect can range from small, simple fixes (such as creating a new fee type) to very large, complex enhancements that include significant system redesign (such as modifying editing functionality across the full MNLARS Vehicle System).
- A **workaround** is a process or additional clarifying information developed by Driver and Vehicle Services (DVS) to assist deputies and internal staff in an alternative way to help a customer.
- **Electronic Vehicle Title Registration (EVTR)** allows customers to get plates and registration from a dealer in order to speed up the registration and plate process.

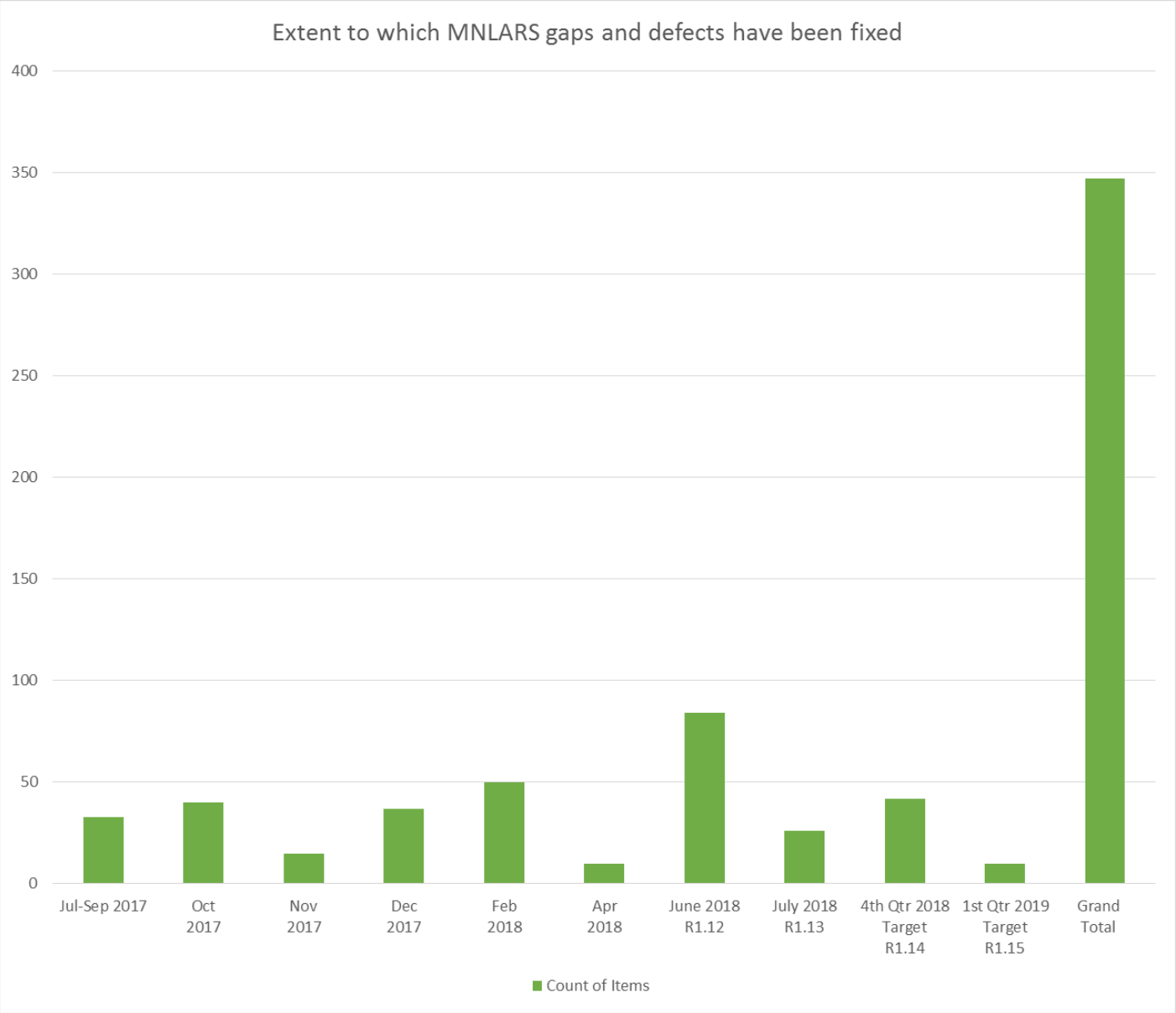



*Figure 1 - Extent to which vehicle services gaps and defects have been fixed*

Figure 1 does not represent the scale or size of each work item delivered, but instead, the progress toward resolving the centralized list of itemized gaps, new feature requests and defects. Some of these itemized issues are very large in scope, like specialty plates in release 1.15.

### Remaining gaps and defects

The MNLARS Vehicle master list tracks gaps, new feature requests and defects. As of September 1, 2018, there are 138 items remaining on the master list. Of these, 46 are gaps, 70 are defects, and 22 are new feature requests. Some of the items remaining on the MNLARS Vehicle master list are quite large (like the addition of editing functionality throughout the application) and others are small fixes (like a request to change the color of the expiration year box – "It's grey and should be bigger").

The MNLARS Vehicle master list is a living document and requires quarterly updating to ensure it aligns with current stakeholder priorities. Starting the last week of May 2018, the MNLARS Vehicle master list underwent a refresh and re-prioritization by stakeholders. This list informs the priorities of feature delivery for the remaining funded releases. Releases 1.14 and 1.15 will deliver the majority of the top 5 tiers of requested features on the master list.

## Performance measure #3 - improvements in the ability of MNLARS Vehicle users to edit transactions

**Update since June 11 report:** Release 1.12 in mid-June provided administrative editing tools for deputy registrar liaisons, allowing them to correct registration data entry errors and perform enhanced inventory management functions. As of mid-August 2018, 2,886 transactions have been updated using the administrative editing tools.

The breakdown is as follows:

| Count | Functionality |
|---|---|
| 685 | Change the class, base value, county, and gross weight on a registration. |
| 1320 | Change the start and end date on the registration. |
| 94 | Change registered plate type on the registration. |
| 26 | Change the status of the sticker to "available." |
| 470 | Change the status of the plate to "available." |
| 251 | Delete a range of plates from a particular inventory location. |
| 40 | Delete a range of stickers from a particular inventory location. |
| 2886 | Total |

In release 1.15, DPS and MNIT are adding the capability for deputy registrars to submit a data correction ticket in MNLARS Vehicle and track its status. This ability to submit known issues quickly and with system-tracked follow-up is a step in the right direction toward the much larger effort it takes to build in formal transaction editing features. More formal editing capabilities will likely include the following features:

- Transaction cancellation or return capability
- Additional inventory management functionality
- Editing an unpaid transaction
- Updating title and registration records outside of transactions
- To add these additional editing capabilities into MNLARS Vehicle, MNIT and DPS must complete system optimization and performance tuning work, and additional funding must be available.

## Performance measure #4 – reduction in the backlog of vehicle title applications

**Update since May report**: The MNLARS Vehicle title application work queue has declined approximately 75% since December 2017 and is shown in the table below.

DVS has been able to reduce the number of transactions in the work queue through a combination of implementing process improvements, staff working overtime, both voluntary and mandatory, and by hiring seasonal staff.

| Date | Title applications in work queue |
|---|---|
| 12/1/2017 | 379,591 |
| 1/2/2018 | 311,312 |
| 2/1/2018 | 222,903 |
| 3/1/2018 | 179,253 |
| 4/1/2018 | 194,949 |
| 5/1/2018 | 204,104 |
| 6/1/2018 | 219,079 |
| 7/1/2018 | 196,247 |
| 8/1/2018 | 141,150 |
| 9/1/2018 | 96,154 |

DVS measures title turnaround by the number of days required to complete an application, beginning when the customer visits the deputy registrar. DVS measures title turnaround times in three classes: out-of-state (OS) applications, manufacturer certificate of origin (MCO) applications and Minnesota (MN) titles.
Figure 2 shows the longest title turnaround times for each title class since February, 2018 while Figure 3 shows historical title turnaround times since May 2009.

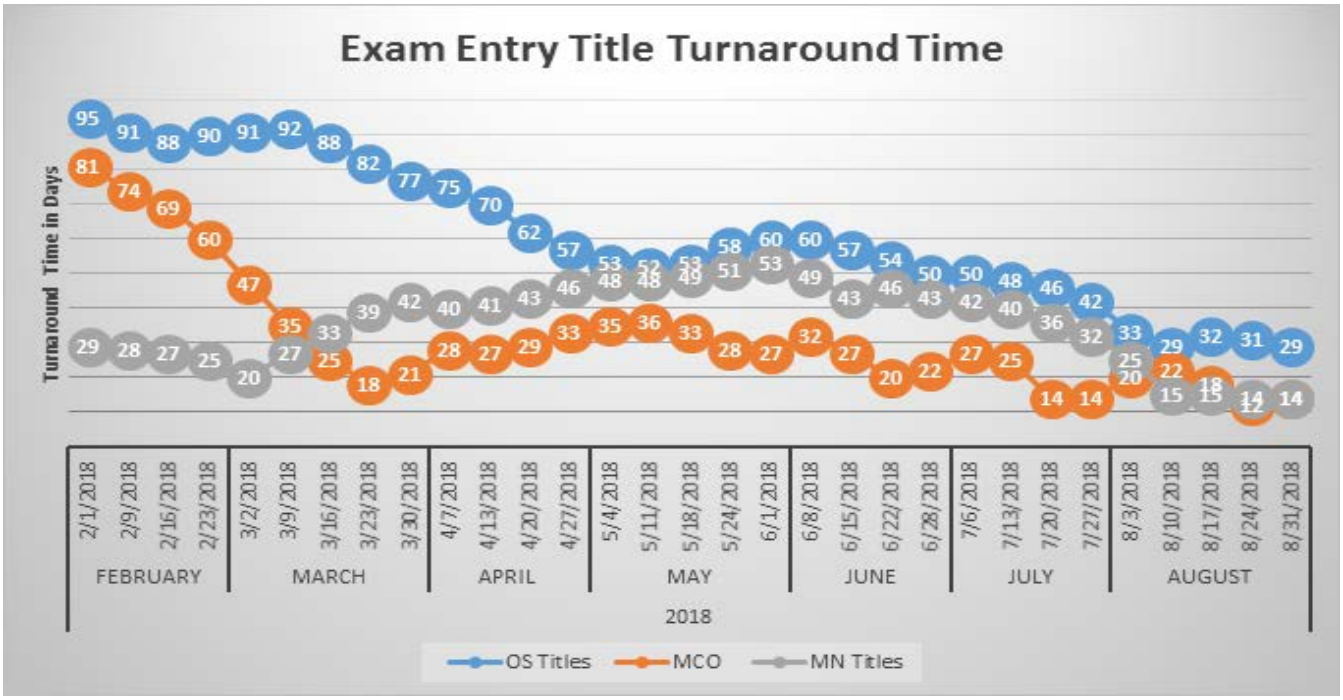



*Figure 2 - Exam entry title turnaround time. Note: for August 31, 2018, both MN Titles and MCO are at 14 days.*

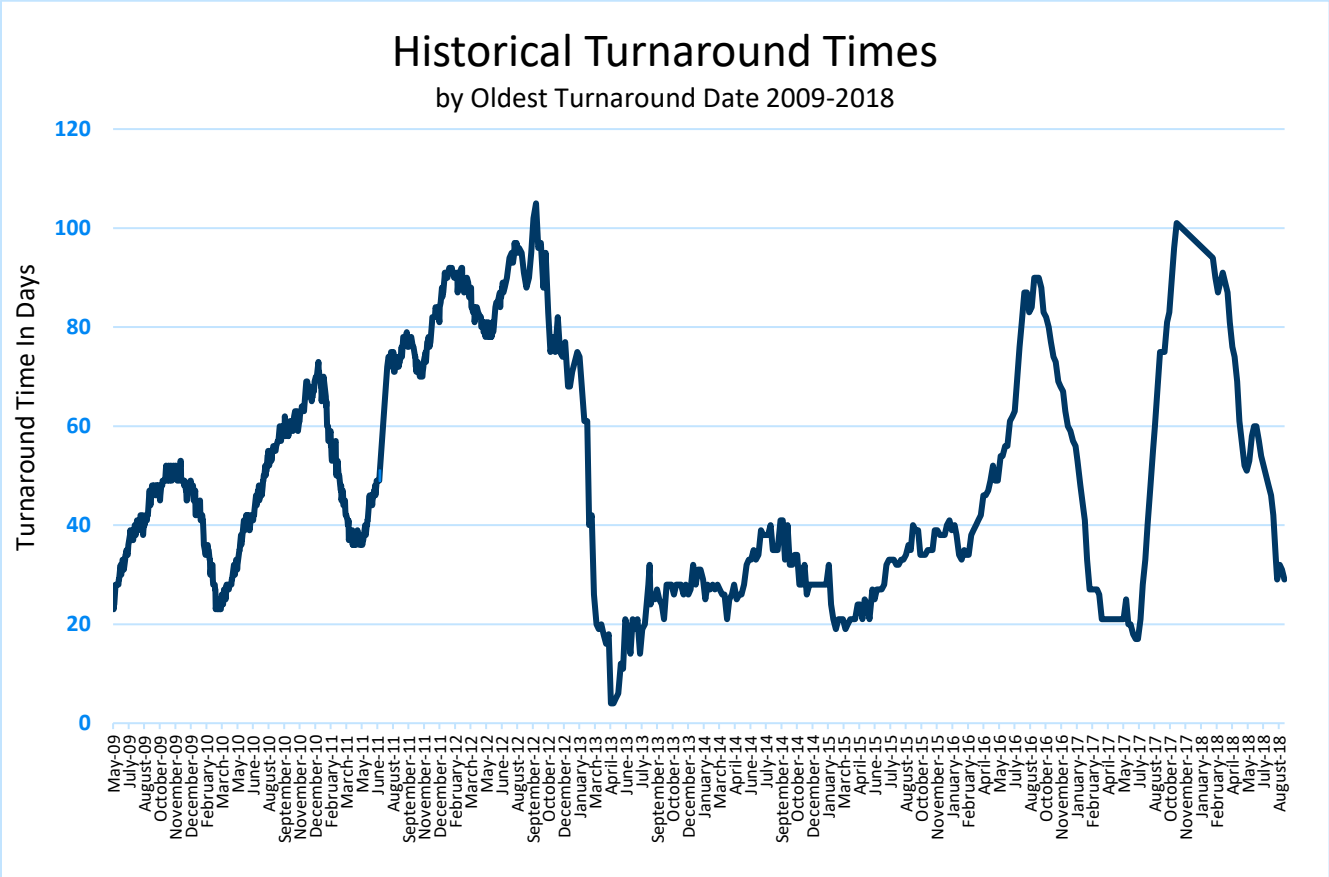



*Figure 3 - Historical title turnaround times since May 2009*

## Performance measure #5 - extent of errors in driver or vehicle services transactions*

There are two main sources of data errors in the system: data entry errors, and transactions hung up due to an error in the system. The current MNLARS Vehicle System has limited record editing capability, and a backlog of errors has built up over time due to this lack of editing capability. MNIT is currently processing a backlog of records that need data correction. To date, approximately one fourth of one percent of the motor vehicle records in the new MNLARS system have required some type of data correction due to system errors. These corrections have been managed by the data corrections team, which was established December 1, 2017.

Motor vehicle transaction errors are fixed as they are identified by the data corrections team. This includes data issues reported by deputy registrars, DPS, and the public. MNIT also runs a series of programs to search through the data to discover and correct discrepancies.

Given additional funding, MNLARS Vehicle has a plan to deliver self-service editing capabilities for Vehicle Services liaisons and deputy registrars, that currently require assistance, including:

- Gross weight not entered correctly in the legacy system.
- Registration transaction is hung up due to an error in the system.
- Control reports to flag any payments for a transaction recorded twice due to an error in the system.
- Fixing data entry errors for registrations and titles.
- Control reports and searches for DVS department to monitor errors in system use including input of values outside of normal usage parameters.
- Incorrectly entered inventory.
- Title transfer was performed on the wrong vehicle.

* Driver Services' legacy mainframe does not have the capability to report transaction errors; this capability will be available after October 1, 2018, in the new Driver system developed by FAST Enterprises.

## Performance measure #6 - system performance including slowdowns, outages or other performance issues

Load testing validates system performance prior to each MNLARS Vehicle release. This performance testing discipline was enhanced in the fall of 2017 to include more tests, greater coverage, and a full copy of the MNLARS Vehicle production environment. Previously, performance testing only occurred quarterly and did not occur with each release that was put into the MNLARS Vehicle System.

### Definitions:

- **Uptime** means the time the system is up and available during business hours.
- A **slowdown** is any system response that returns in less than one second.
- An **outage** is a period of time that a system fails to provide or perform its primary function.
- **Legacy driver** is a legacy system that supports driver services, which will be replaced by the FAST Driver System in October of 2018.
- **Mainframe** is a legacy system that supports vehicle services.

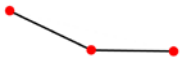
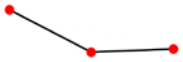
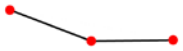
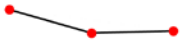
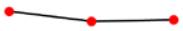
### Uptime, slowdowns and outages

In addition to load testing, the operations team tracks uptime for the systems that system stakeholders use. Industry standard for a slowdown is to alert any transaction that returns in over four seconds, but due to the importance of system performance for MNLARS Vehicle, MNIT and DPS set the bar higher for monitoring and reporting to issue alerts for any potential performance issues and traditional performance issues. For the purposes of the graphs below potential performance slowdowns, known performance slowdowns and outages have been summarized as outages. However, it is important to acknowledge, downtimes and slowdowns both have adverse effects on how deputy registrars, auto dealers and other stakeholders conduct business.

### System response time test results

**Update since June report:** There are no statistically significant changes to system response times in MNLARS Vehicle between the June 11, 2018 report and this September 11, 2018 report. Due to reduced MNLARS Vehicle funding, the team size of performance tuning developers has been reduced, and this slows down our release of performance improvements on MNLARS. However, performance remains stable. Also, tests for release 1.12 and 1.13 indicated the system performs as well as or slightly better than prior MNLARS Vehicle releases. We continue to evaluate system performance with each release to ensure performance does not degrade with subsequent releases.

The following chart demonstrates the improved response time since launch and for the last 2 releases. When the system launched, response time varied by transactions. The “apply for title” transaction took 25 seconds to load, and today the same transaction takes under seven seconds. Less complicated transactions, like “sign-in”, took three seconds to load, and today it takes less than one second.

| Release | MNLARS launch | 11.12 | 1.13 | | |
|---|---|---|---|---|---|
| **Test Information** | **90 percent - 7/19 baseline** | **90 percent - 5/21 baseline** | **90 percent - 7/10 baseline** | | |
| Transaction Name **HTTP Load Scripts** | 90% | | | **Trend** | **Summary** |
| **Sign-In** | 3.239 | .82 | 0.755 |  | Measures the time it takes the user's credentials to be authenticated against MNEIAM and successfully log into the system. |
| **Title Queue** | New functionality added | 4.6 | 6.74 |  | This is the backlog of titles that are currently being processed. These transactions represent navigating to and around the queue. **Uptrend is a result from larger table sizes.** |
| **Deputy registrar search** | 2.61 | .609 | 0.755 |  | These transaction are the various search transaction/options that deputy registrars use throughout the workday. |
| **Apply for title** | 25.676 | 6.87 | 7.5 |  | "Apply for title" represents one of the most commonly used business transactions in MNLARS. The steps indicated in 20-28 are the typical user workflow. |
| **Registration renewal** | 12.52 | 5.96 | 6.5 |  | "Registration renewal" represents the core transaction of MNLARS. Like "apply For title," it exercises a large part of the system's internal functionality/API calls (i.e. vehicle, inventory, finance, 3rd party calls, and online registration.) |
| **Title transfer** | 15.098 | 5.97 | 6.88 |  | "Title transfer" allows users to transfer a title to another party. |

Load testing has been successfully utilized prior to each MNLARS Vehicle release for 2017 and 2018. This performance testing discipline is the most effective way to insure the following objectives:

1. Identify software or system bottlenecks prior to production release.
2. Determine application configuration issues and provide tuning guidance.
3. Validates system capacity is sufficient.
4. Ensure system resources scale linearly as workload increases.
5. Seeks to find memory leaks and other types of performance constraints that would impact system performance.
6. Mitigates three core risks: Speed, scalability and stability.
    a. **Speed:** How fast does the system process the request?
    b. **Scalability:** How well do system resources scale under load and increased concurrency levels?
    c. **Stability:** Measures system uptime under prolonged use and extreme load conditions
7. Actual performance results experienced in the field will greatly depend on the consumer's network quality, i.e. bandwidth, packet loss, network congestion, and latency with latency having the greatest impact on EU performance.

## Vehicle systems uptime: June 2018, July 2018 and August 2018

**Update since June 11 Report:** Subsequently, MNLARS Vehicle and legacy systems have returned to 99% uptime.

Figures 4, 5 and 6 show uptime and slowdowns, measured in hours, for the months of June, July and August of 2018 for all vehicle systems. The systems averaged over 99% uptime over the quarter during business hours. These graphs also show the downtime for each of the vehicle systems supported, including legacy driver and the mainframe, but system slowdowns cannot be tracked on these legacy systems. On the far right of the graphs, uptime and outage metrics include both system slowdowns and outages for the MNLARS Vehicle System and DVS permits.

MNIT has set a one second response time alert on its monitoring tools, which is far more aggressive than the four second industry standard. The uptime numbers shown below summarizes all outages and slowdowns over one second

### June 2018 uptime:

- DVS Permits – 99.55% uptime with no slowdowns or outages
- ESupport – 100% uptime with no slowdowns or outages
- Mainframe – 100% uptime with no slowdowns or outages
- MNLARS Vehicle – 98.87% uptime with no slowdowns or outages

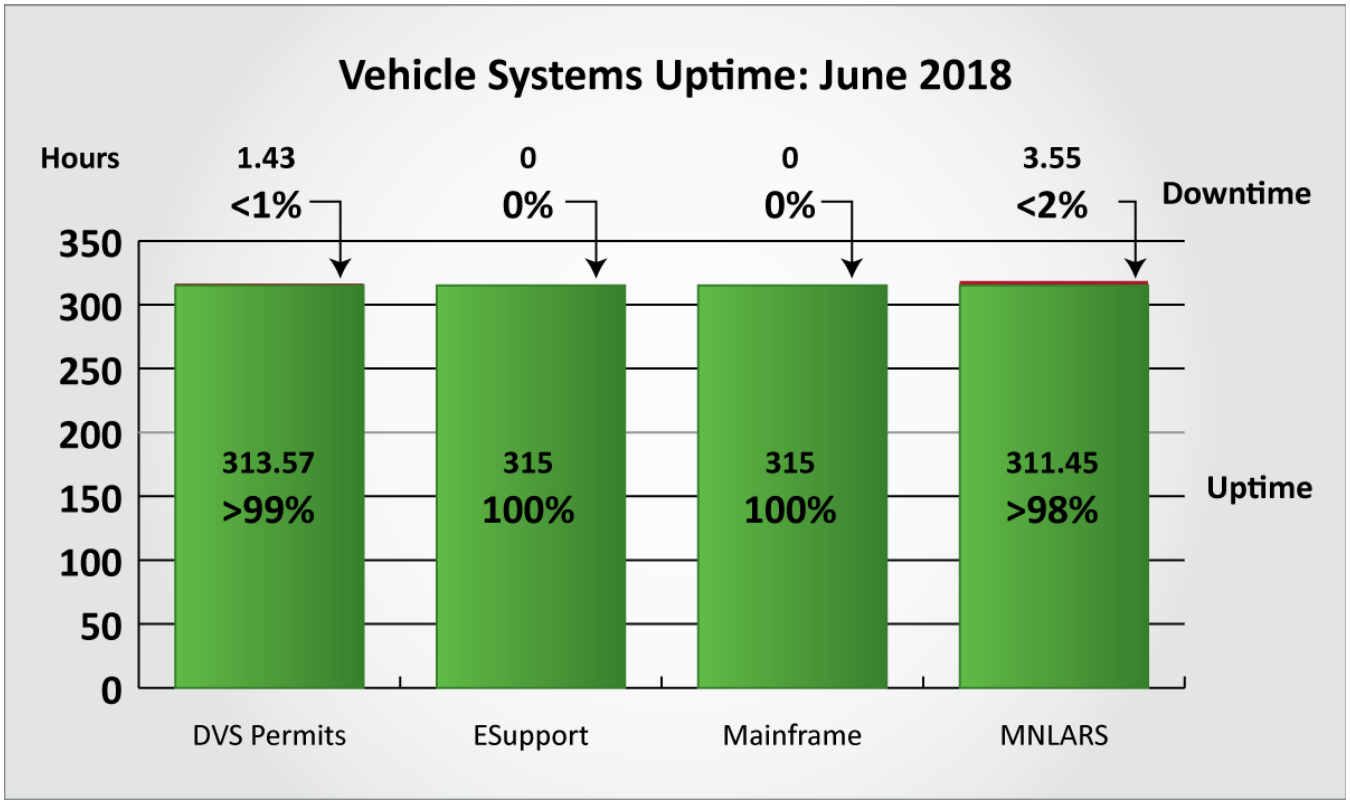



*Figure 4 - Vehicle systems uptime: June 2018*

### July 2018 uptime:

- DVS Permits – 99.57% uptime with no slowdowns or outages
- ESupport – 100% uptime with no slowdowns or outages
- Mainframe – 100% uptime with no slowdowns or outages
- MNLARS Vehicle – 99.83% uptime with no slowdowns or outages

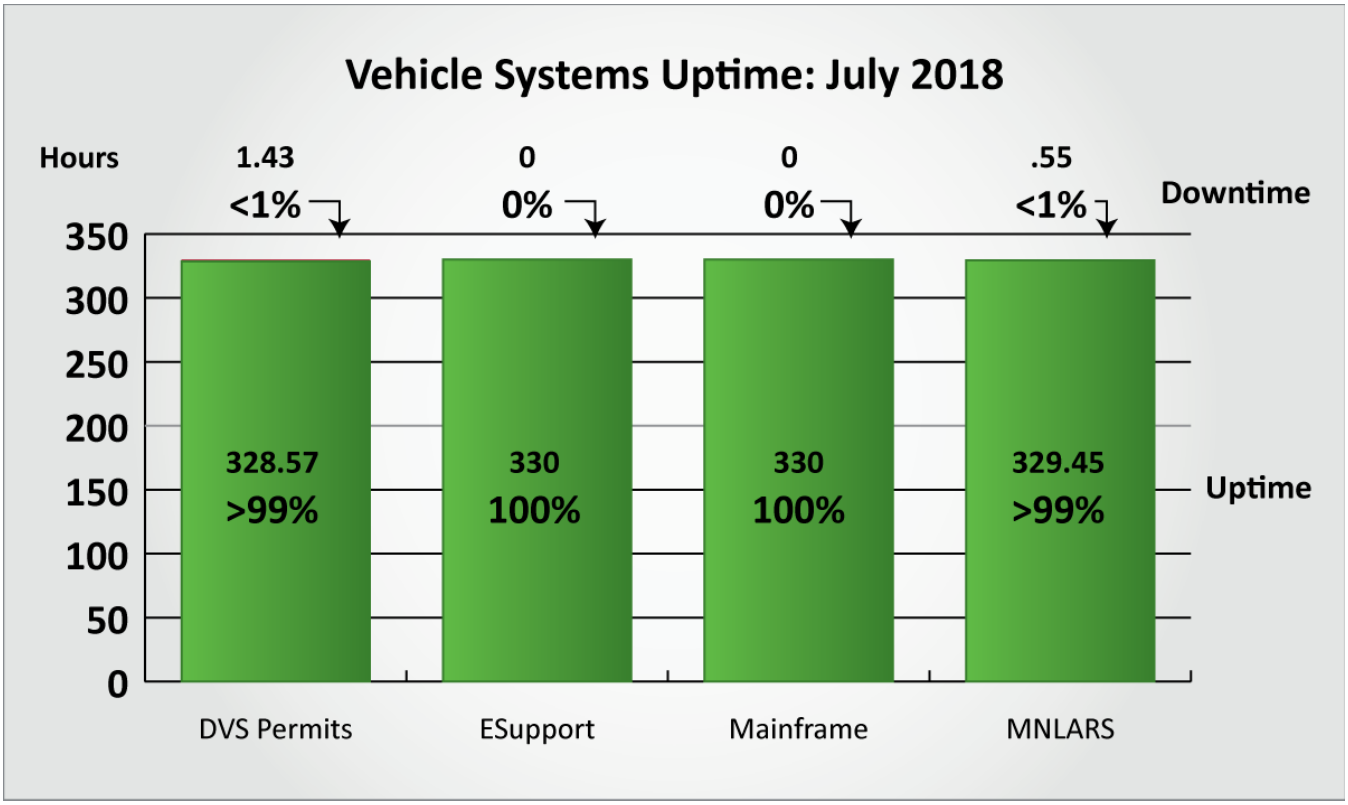



*Figure 5 - Vehicle systems uptime: July 2018*

### August 2018 uptime:

- DVS Permits – 100% uptime with no slowdowns or outages
- ESupport – 100% uptime with no slowdowns or outages
- Mainframe – 100% uptime with no slowdowns or outages
- MNLARS Vehicle – 99.9% uptime with no slowdowns or outages

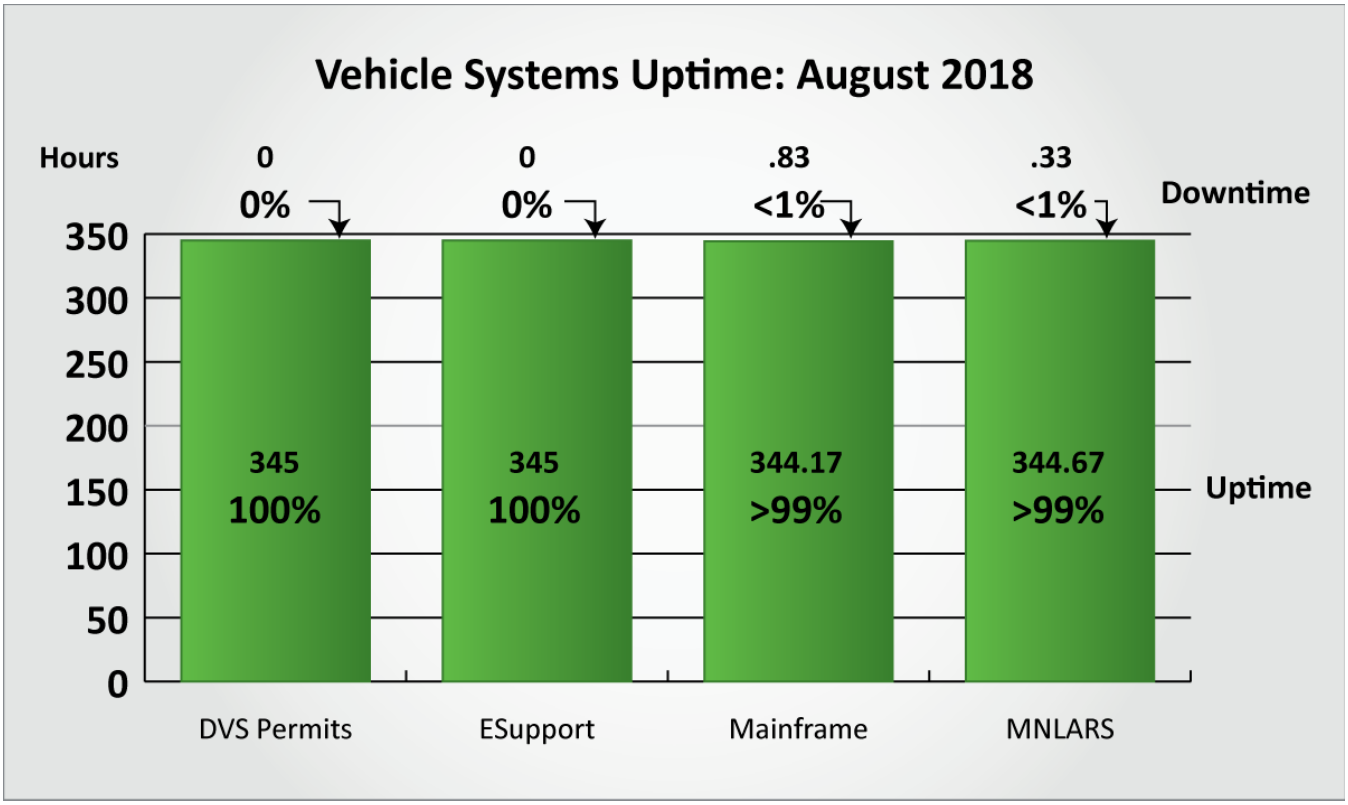



*Figure 6 - Vehicle systems uptime: August 2018*

## Performance measure #7 - customer service responsiveness

The DVS Contact Center encompasses 24 phone lines and several email channels. Unlimited phone servicing is provided to law enforcement and deputy registrars with priority routing in front of general public calls. Unlimited email servicing is provided with response times based on the capacity of available agents. Public phone lines have limited servicing based on the capacity of available agents and size of the phone network, causing incoming calls to be rejected when exceeding these capacities. During the June 2018 - August 2018 time period 838,668 calls were received, of which 452,211 calls (53.92%) were rejected and sent to a busy message. Compared to the preceding quarter (March 2018 to May 2018), call volumes decreased 16.6%.

To improve customer service, DVS implemented mandatory overtime and hired, and continues to hire, temporary staff to reduce the number of unanswered calls and untimely emails. In addition, the Department of Administration Office of Continuous Improvement is assessing the PIC to determine possible business processes that will also improve customer service.

Figure 7 shows the call volume pre and post-MNLARS. The vertical line represents the date of the MNLARS Vehicle rollout.

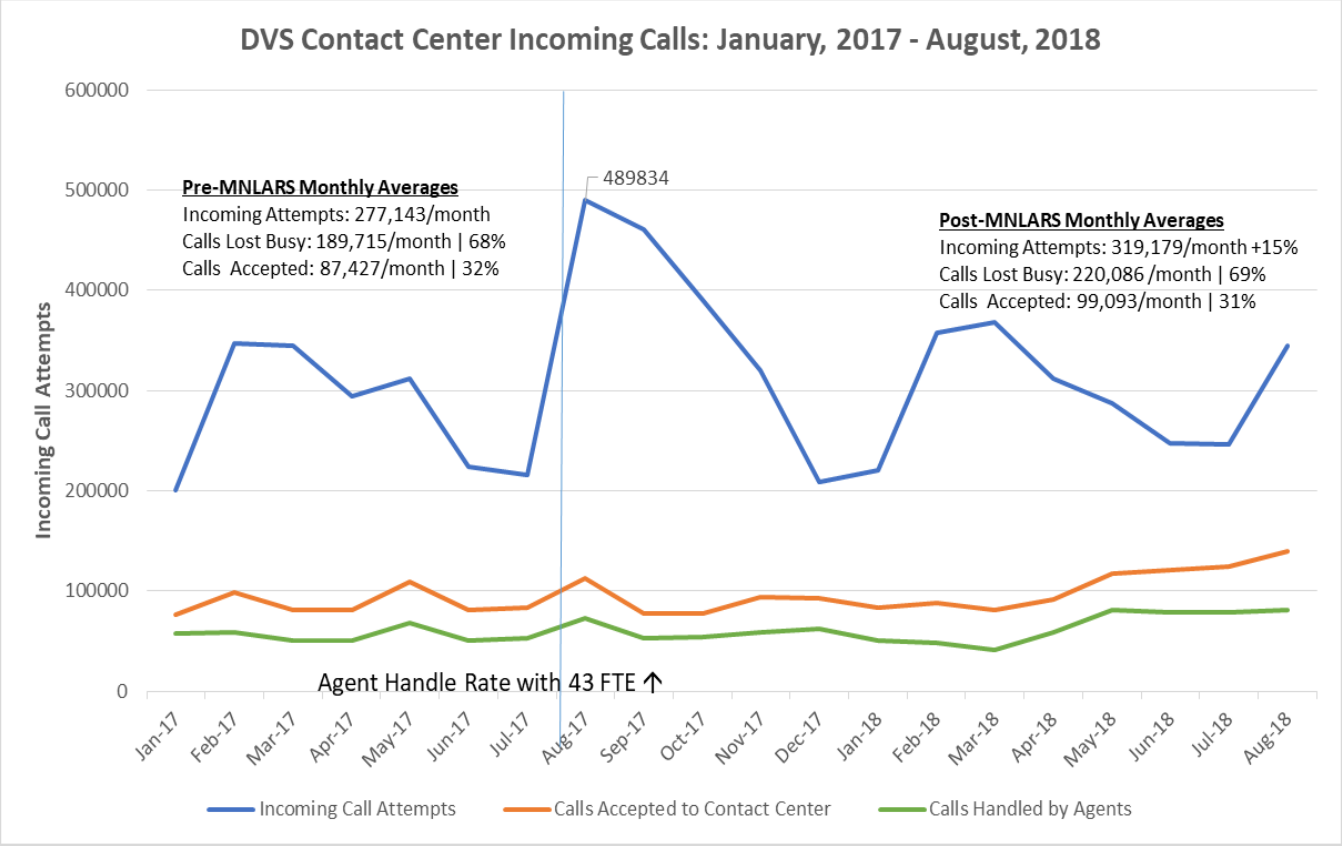



*Figure 7 - DVS contact center incoming calls: January, 2017 - August, 2018*

## Total calls to DVS contact center from 06/01/2018 to 8/31/2018

The following chart contains specific information about the volume of calls and emails to the Public Information Center (PIC) from June-August 2018.

| Phone line | Number of calls |
|---|---|
| Public phone lines (19) | 802,103 |
| Deputy registrar* lines (2) | 35,786 |
| Law enforcement line (1) | 779 |
| Total calls | 838,668 |

*DPS Driver and Vehicle Services Registrar lines include deputy registrar and driver's license agents.

## All public communication – public phone lines (19)

| Call type | Number of calls |
|---|---|
| Incoming calls | 802,103 |
| Accepted calls | 349,892 |
| Rejected calls | 452,211 |
| Calls offered to agents | 249,749 |
| Abandoned calls | 32,905 |
| Calls handled by agents | 213,501 |
| Average speed to answer | 04:30 minutes |

*Public communication does not track MNLARS specific calls to public phone lines.

## Definitions:

**Incoming calls:** All attempted calls to the contact center.
**Accepted calls:** Calls that immediately entered the contact center system upon dial without busy.
**Rejected calls:** Calls rejected due to high volume and sent to a busy message.
**Calls offered to agents:** Caller has selected a menu option and was placed in queue to speak to a live agent.
**Abandoned calls:** Queued calls to speak to a live agent that disconnect/hang-up while in the queue.
**Calls handled by agents:** Queued callers have been connected to speak to a live agent.

## All public communication – email

| Email type | Number of emails |
|---|---|
| Vehicle services emails received | 9,473 emails |
| Driver services emails received | 11,706 emails |
| Outgoing responses | 39,488 emails |
| Total unprocessed emails | 1,997 emails – on 8/31/18 |
| Furthest date unprocessed | 8/22/18 (9 days) – on 8/31/18 |

## Deputy registrar communication – deputy registrar phone lines (2)

| Call type | Number of calls |
|---|---|
| Total calls from deputy registrars | 35,786 |
| Segment: MNLARS Vehicle specific calls | 7,238 |
| Average speed to answer | 10:01 minutes |

MNLARS Vehicle calls* are those selecting option “MNLARS Navigation” or “MNLARS Transaction.”

### Deputy registrar communication – email

| Email type | Number of emails |
|---|---|
| Total emails from deputy registrars | 8,743 |
| Total unprocessed emails | 917 emails – on 8/31/18 |
| Furthest date unprocessed | 8/28/2018 (3 days) – on 8/31/18 |

## Plan for user acceptance testing (UAT)

DVS staff performs user acceptance testing (UAT) to ensure that all business and system requirements are met. DVS staff develops test scenarios and writes test cases based on new functionality, and DVS staff tests these scenarios and cases prior to each release. DVS staff also perform regression testing to ensure existing functionality remains as it was built. This is an ongoing process throughout the building of the MNLARS Vehicle System.

DVS/MNIT will conduct two types of UAT to validate upcoming releases. DVS plans pre-release demonstrations with stakeholders, and shares test scenarios ahead of demonstrations in order to elicit feedback on test coverage and system functionality. DVS/MNIT also will engage stakeholders to do "live" UAT testing, using the same business test scenarios as in the demonstration.

### UAT demonstration

DVS/MNIT has modified the UAT process to host webinar demonstrations and live UAT demonstrations in Saint Paul. This provides stakeholders the ability to give more complex feedback about multiple scenarios that could happen under a given transaction. DVS/MNIT included this model of UAT on the 1.12 and 1.13 releases.

Participating stakeholders are notified five days prior to a UAT demonstration to make sure they can successfully sign in to WebEx. During UAT, DVS presents how a fix or functionality will work in the system. Additionally, they collect any feedback or concerns that stakeholders have. DVS hosts the UAT demonstration before the release goes live and polls the stakeholders at the end of the UAT to get feedback on whether or not they believe the defect was corrected.

### Stakeholder "live" user acceptance testing

UAT testing included stakeholders coming in person to St. Paul to execute business test scenarios using the MNLARS Vehicle UAT test system. DVS hosted "live" morning and afternoon sessions on the 1.12 and 1.13 releases.

Stakeholders have a choice of which method would give them the most assurance that the release works within the scope of the defects and gaps addressed.

## Plan for stakeholder input on code releases to MNLARS Vehicle

### Executive Steering Committee

The Executive Steering Committee is comprised of the Minnesota Deputy Registrars Association, the Minnesota Deputy Registrar Business Owners Association, the Minnesota Auto Dealers Association, the Northland Auto Dealers Association, Manheim Auto Auctions and MNIT and DPS personnel. It currently meets every Wednesday from 2-4 p.m. During those meetings, the focus centers on how MNIT and DPS are making MNLARS better. The Executive Steering Committee recently went through another prioritization process of the master list, which includes both defects and gaps in functionality. The result of that process is an updated master list reflecting current priorities of all stakeholders. This updated master list is included in the report.

### Master list process

Members of the Executive Steering Committee completed the reprioritization of the master list on June 5. Provided the project is not ramped-down, reprioritization will continue to be scheduled on a quarterly basis since it's a process that needs to accommodate changes bound to occur in the normal course of business.

The items in any given release will rarely be delivered in exact order of ranking. There are many factors that come into the bundling process for each release. While stakeholder priorities are the number one factor in deciding what is included in a release, with a multi-disciplined approach, it will never be the only factor. IT also determines the optimal sequence in packaging to address the priority items on the list based on the ability to build any given item into the system.

Once the content of the release is put together, the ESC reviews the list. MNIT and DPS walk through each line item and members have the opportunity to give feedback and ask questions about overall content.

### Emergency master list additions process

MNIT and DPS have established an emergency escalation process. This process allows any member of the ESC to bring an urgent need to the table. MNIT can also bring up critical security-related items that it must act upon immediately to avoid a data or access breach.

The item of concern gets elevated to the emergency ESC subcommittee. These members volunteer for a "tour of duty" – to be available at short notice and help triage any critical issues. Different ESC members rotate to fill this role every three months. These members help decide a plan of action and assist MNIT and DPS in reporting out any decisions made on a particular emergency item at the next ESC meeting the following week.

## Post deployment production testing

Live-in-field release tests occur with each release. Each participating deputy registrar tests the release with actual customer transactions during post deployment check out. With this live testing, we are able to confirm every transaction the deputy registrars process go through successfully in the system, to ensure there is no need to roll back the release.

Prior to the in-field testing, the UAT team sends out identified test scenarios to a number of stakeholders who then make sure that they have real transaction data that can be used to test the scenarios. This data is an actual transaction the stakeholder will process for their customer on the day of testing, since their system will be live.

MNIT and DPS notify volunteer testers 30 minutes in advance of when the test process begins. MNIT and DPS use WebEx for screen sharing and monitoring purposes. Stakeholders perform their transaction while on a conference call with the UAT team and other registrars and auto dealers. This way, testers have the ability to confirm the transaction or share any issues or concerns they have.

After testing each item, the UAT team asks stakeholders to verbally acknowledge that their test was successful. If the stakeholders are unable to do so, someone on the UAT team will get all of the details about what went wrong with the transaction and take that back to the designated emergency ESC in an immediate conference call. Should something unexpected occur, a go/no-go decision may be required. The emergency ESC makes that decision with DPS and MNIT.

# Plan for communications for transparent MNLARS Vehicle outages and system slowdowns

The communication plan is comprised of a three part process to keep stakeholders informed and updated as soon as MNIT and DPS become aware that something is wrong with either MNLARS Vehicle or one of the DVS legacy systems (legacy driver, mainframe, motor vehicle permits).

***Step 1:*** Send preliminary notification to stakeholders confirming there is an issue.
***Step 2*:** Identify issue with stakeholders, give approximate timeline for resolution.
***Step 3:*** Send final notification indicating resolution and providing additional details when necessary.

## MNLARS Vehicle service interruption - communication procedure

To ensure continuity of operations and service, MNLARS Vehicle, legacy driver, and motor vehicle permits staff will enact the communications procedure outlined below.

**0-30 minutes** Determination of impacted applications and services.

**< 30 minutes** **First stakeholder notification:**

DPS service desk sends initial communication sent to deputy registrars and dealers, acknowledging that MNIT and DPS know there is an issue with MNLARS Vehicle or one of the legacy systems (legacy driver, mainframe, motor vehicle permits). As soon as possible, DPS service desk sends the generic preliminary notification to system users.

Delivery method:

- DVS staff sent via Outlook
- Deputy registrar and dealers via GovDelivery

**30-45 minutes** DPS service desk further escalates and troubleshoots, implements ESC procedures, and participates in technology and management bridge calls.

**45-60 minutes** **Second stakeholder notification:**

DPS service desks sends an update to initial communications – includes additional details, resolution, or estimated time to resolution. *Subsequent communications follow every 60 minutes until resolution.*

DVS communications sends the notification within 15-30 minutes of first one.

DVS communications works with DPS service desk and the DPS Office of Communications to craft a more comprehensive message about what system is affected, what the problem may be, and, if possible, the anticipated length of the outage.

Delivery method:

- DVS staff sent via Outlook
- Deputy registrars and dealers via GovDelivery

| | |
|---|---|
| **Resolution** | **Resolution notification to stakeholders:**<br>Notification is sent after the resolution is found and services are confirmed as fully restored.<br>DVS communications works with DPS service desk and the DPS Office of Communications to craft a resolution notification with root cause analysis, total impact, and any additional information regarding service outage or slowdown.<br>Delivery method:<br>• DVS staff sent via Outlook<br>• Deputy registrars and dealers via GovDelivery |

# Proposed plan for post-release reporting on features and fixes to system stakeholders

Three items need to be included in communications about all future releases. The first item is to socialize the actual content of the release, making sure that stakeholders are aware of what is changing and that MNIT and DPS can answer any questions they may have about the release. The second item is to share a report once the UAT demonstration is finished, to ensure stakeholders know that the UAT demo is complete, and to provide any necessary information or feedback received from the process. The third and final item is a post-release follow-up, confirming whether or not live-in-field testing went well and what, if any, additional feedback MNIT and DPS received since the release went into the system.

## Socialize release content

Once the ESC has determined and vetted the content of each release, all stakeholders will receive the itemized release list, along with highlighted priorities, before it goes live in the system. After the content is socialized, MNIT and DPS start the UAT process.

## UAT report out

When MNIT and DPS get into the testing phase of each of the releases, the stakeholders will receive an updated report on the status of the UAT.

If there are significant issues during the UAT phase and as a result the release is postponed, the stakeholders will receive a follow-up notification that the release has been postponed. This notification will include the reason for postponement. When possible, the notification will include the rescheduled release date.

It can be difficult to identify this date quickly because the release will still be in the testing phase. MNIT and DPS will not deliver a release until the UAT team has worked out all the issues that made it a “show-stopper” and fixed them.

## Post-release reporting

Once a release has been deployed into the system and has had 3-5 business days to run, the stakeholders will receive a follow-up email either notifying them of the success of the release, or notifying them of any issues they may experience as a direct result of the release. If there is additional action or notification needed, the UAT team will follow up with all stakeholders.

# Plan to create greater efficiencies and streamline title processing to reduce and minimize backlogs

As was noted in earlier reports, DVS continues to uses a multi-focused strategy to reduce and minimize backlogs, which includes using overtime for DVS staff, employing seasonal employees, and contracting for temporary staff.

Additionally, DVS has engaged with the Department of Administration's Office of Continuous Improvement team to review processes and identity potential improvements. To date, DVS, in partnership with the Continuous Improvement team, has established and deployed a knowledge base for processing teams, which includes standard work processes and process standards. Additionally, they've developed and deployed more effective team resources in work queues to eliminate backlogs, and deployed more effective team work planning and organization tools to eliminate backlogs.

| Staffing changes | Comments |
|---|---|
| **Driver and Vehicles Services title and registration employees.** | Working voluntary and mandatory overtime to address title backlog. |
| **Dept. of Revenue seasonal employees**<br><br>(These are seasonal staff who the Dept. of Revenue employs during the tax season.) | DVS contracted for 45 temporary, seasonal employees to work on manufacturer certificate of origin (MCO) title transactions and Minnesota (MN) title transactions. |
| **Ally Business Solutions, LLC**<br><br>(A St. Paul non-profit organization that match the skills and interests of people with disabilities to the needs of private business and government agencies.) | An average of 16 contracted employees work on manufacturer certificate of origin (MCO) and Minnesota title transactions. |

## Request for information (RFI)

The following companies responded to the April 30, 2018 RFI solicitation in the *State Registrar*.

These companies submitted responses to the RFI by the May 31, 2018 4:00 deadline:

- Business Information Systems (website: http://www2.bisonline.com/)
- Celtic Systems (website: https://www.celtic.bz/Hub)
- FAST Enterprises (website: https://www.fastenterprises.com/)

The summary of the responses and information received from qualified vendors was submitted to the committee and the information technology auditor by August 1. 2018 as required by 2018 Minnesota Session Laws, Chapter 101, Section 2, Subd.5 (e).

## MNLARS Vehicle budget update

Provided below is the MNLARS Vehicle budget for fiscal year 2018 and 2019. It should be noted that in the absence of additional funding, the state faces a number of serious concerns, including the inability to retain and recruit talent, address priority fixes and gaps in the system, fully move production from the mainframe, allow for needed maintenance, and hire sufficient staff to provide the level of oversight identified in other reports.

The budget is in a number of tables, including a budget summary (Table 1) and a special rider budget (Table 2). Please note that due to budget restrictions during FY 2018, the MNLARS project experienced a period of several months where spending was slowed due to ramp-down of the project and contractor uncertainty. As a result, some of the funding provided last session will be spent in FY 2019, rather than as expected in Q4 FY 2018.

## Table 1 – budget summary

Table 1, the budget summary, includes a breakdown of revenues and costs rolled-up to a summary-level similar to that previously provided to the legislature as part of the full funding budget from the Governor's recommendations. It includes revenues, expenditures, encumbrances, and forecasted spend. "Expenditures" are monies paid subject to an invoice or expense incurred. "Encumbrances" are monies set aside for payment after an obligation for payment has been established, but no invoice has yet been approved or paid. "Forecasted spend" includes planned expenditures and encumbrances that are anticipated, but have yet to be either paid-out or set-aside.

| **Financial reporting for vehicle & driver for reporting period ending 8/24/2018 (in thousands)** | **FY2018** | | | **FY2019** |
|---|---|---|---|---|
| **Revenues** | | | **Total** | **Budget** |
| Special revenue | - | - | 3,738 | 5,912 |
| Carryforward | - | - | 12,641 | 14,071 |
| Receipts | - | - | 2,130 | 1,900 |
| Transfers in | - | - | 8,000 | 8,000 |
| Total revenue | - | - | 26,509 | 29,883 |
| **Expenditures - Driver** | **YTD spend** | **Encumbered & forecast** | **Total** | **Budget** |
| FAST contract | 4,250 | 4,000 | 8,250 | 9,500[1] |
| FAST DVS staff | - | - | - | 832 |
| MNIT Drivers staff | 41 | - | 41 | 485 |
| FAST contractors | 794 | 41 | 834 | 1,171 |
| Technology costs | 32 | - | 32 | 93 |
| Total driver | 5,776 | 4,041 | 9,817 | 13,886 |
| **Expenditures - Vehicle** | **YTD spend** | **Encumbered & forecast** | **Total** | **Budget** |
| Contractors | 10,816 | 212 | 11,028 | 8,212 |
| DVS staff | 416 | - | 416 | 688 |
| MNIT staff | 2,740 | - | 2,740 | 2,844 |
| Technology costs | 2,287 | - | 2,287 | 4,124 |
| Other spent | 221 | - | 221 | 128 |
| Total vehicle | 16,480 | 212 | 16,692 | 15,997 |
| **Total driver and vehicle** | $22,256 | $4,252 | $26,509 | $29,883 |

[1] The FY19 FAST contract line does not include the full $15M FY19 payment to FAST. It assumes restructuring to the FAST contract. Restructuring may impact the total cost of the FAST contract.

## Table 2 – special rider budget

Table 2, the special rider budget, contains an accounting of the use of fund provided under MN Laws 2018, ch. 101, including $7,051,000 for contracting to perform software development on the vehicle services component of MNLARS and $2,599,000 for technology costs. The numbers contained in this table are contained in the data provided in table 1, but are addressed separately here.

DPS and MNIT have submitted a separate letter accompanying this report detailing a request to amend three riders below: (1) user authentication and access control management, (2) contracted software review and software development support services, and (3) contracting to perform software development on the vehicle services system. This request would increase the contracting to perform software development rider by $93,000 which would support contractor costs associated with release 1.15.

| **Special rider budget for reporting period ending 8/24/2018 (in thousands)** | **FY2018** | | | | **FY 2019** | **Total** | |
|---|---|---|---|---|---|---|---|
| Rider | Budget | YTD spend | Encumbered & Forecast | Total | Budget | Forecast Use | Remaining |
| Contracting | 7,051 | 3,221 | 204 | 3,425 | 3,626 | 3,626 | - |
| User authentication & access control | 100 | 17 | - | 17 | 83 | 61 | 23 |
| Testing environment., hardware, server & data | 20 | 18 | - | 18 | 2 | - | 2 |
| Partial relocation of data center | 650 | - | - | - | 650 | 650 | - |
| Disaster recovery & preparedness | 780 | 113 | - | 113 | 667 | 667 | - |
| Contracted software review & software development Support | 1,049 | 165 | - | 165 | 884 | 815 | 68 |
| **Total** | $9,650 | $3,534 | $204 | $3,738 | $5,912 | $5,819 | $93 |

# FY 2018 Q4 spend for employees and contractors

Spend for MNIT and DPS employees in FY 2018 Q4 are identified below and contain staff charges allocated to the MNLARS Vehicle project for each position, as well as an indication for each position of the number of dedicated staff and non-dedicated staff (those that spend part of their time supporting MNLARS Vehicle, but not assigned to the project).

## Table 3 – amount spent for MNIT employees in FY 2018 Q4

| Position | Dedicated staff | Non-dedicated staff | Q4 spend (in Thousands) |
|---|---|---|---|
| Managers/supervisors | 1 | 1 | 39 |
| Project managers/admin support | 1 | - | 50 |
| Technical/software architects | - | - | - |
| Software developers | 8 | 2 | 266 |
| Operations | 10 | 4 | 531 |
| Technical support | 5 | - | 42 |
| Separation payout (Q4) | - | - | 11 |
| **Total** | 25 | 7 | $937 |

## Table 4 – amount spent for DPS employees in FY 2018 Q4

| Position | Dedicated Staff | Non-Dedicated Staff | Q4 Spend (in Thousands) |
|---|---|---|---|
| Business Program Director | 1 | - | 109 |
| Business Management Analyst | 1 | - | 27 |
| **Total** | 2 | - | $136 |

## Table 5 – amount spent (in thousands) for contractors in FY 2018 Q4

Spend for MNIT contractors in FY 2018 Q4 is shown below and contains the amount (in thousands) paid by the MNLARS Vehicle project for each contractor. Each contractor may have one or more billed resources placed on the project or may be paid upon completion of deliverables without regard to the number of resources engaged.

| Contractor | Amount spent (in thousands) |
|---|---|
| Ambient Consulting Solutions | - |
| American Association of Motor Vehicle | 7 |
| American Databank | 1 |
| Analysts International Corp | 128 |
| Charter Solutions Inc | 340 |
| Dahl Consulting | 144 |
| Edchunk Inc | - |
| Elegant Enterprise Wide Solutions Inc | 64 |
| Fast Enterprises LLC | - |
| Globalsource Info Tech Iii | 119 |
| Iceberg Tech Group | 75 |
| Integration Architects Inc | 32 |
| International Projects | 269 |
| Intertech Inc | 88 |
| Knowledge It A Cooperative | 420 |
| License Bureau Inc | - |
| Lighthouse Software Solutions | 723 |
| Logisolve LLC | 82 |
| Minnesota Management & Budget | - |
| Modis Inc | 14 |
| Polk R L & Co | 35 |
| Public Safety Dept. | - |
| Sdk Technical Services | 102 |
| Software Engineering Services | 33 |
| Sogeti Usa | 50 |
| Sogeti Usa LLC | 1,366 |
| Supersonic | 83 |
| Systems Advantage Inc | 220 |
| Talent Software Services Inc | 70 |
| Trissential | - |
| Zinncorp Inc It Doctors | 108 |
| **Total** | **$4,574** |