STATE OF MICHIGAN
ENTERPRISE PROCUREMENT

Department of Technology, Management, and Budget
320 S. Walnut Street 2nd Floor Lansing, MI 48933
P.O. BOX 30026 LANSING, MICHIGAN 48909

CONTRACT CHANGE NOTICE

Change Notice Number **1**
to
Contract Number **MA230000000396**

CONTRACTOR	
	Parsons Transportation Group Inc. of Michigan
	2677 Central Park Blvd Suite 275
	Southfield Mi 48076
	Joseph Brahm
	262-391-8056
	joseph.brahm@parsons.com
	CV0017188

STATE			
	Program Manager	Various	Various
	Contract Administrator	Corbin Montry	DTMB
		5175990012	
		montryc@michigan.gov	

CONTRACT SUMMARY			
Advanced Traffic Management System			
INITIAL EFFECTIVE DATE	**INITIAL EXPIRATION DATE**	**INITIAL AVAILABLE OPTIONS**	**EXPIRATION DATE BEFORE**
January 5, 2023	January 4, 2028	5 - 12 Months	January 4, 2028
PAYMENT TERMS		**DELIVERY TIMEFRAME**	
NET45		N/A	
ALTERNATE PAYMENT OPTIONS		**EXTENDED PURCHASING**	
☐ P-Card ☐ Direct Voucher (PRC) ☐ Other		☒ Yes ☐ No	
MINIMUM DELIVERY REQUIREMENTS			
N/A			

DESCRIPTION OF CHANGE NOTICE				
OPTION	**LENGTH OF OPTION**	**EXTENSION**	**LENGTH OF EXTENSION**	**REVISED EXP. DATE**
☐		☐		

CURRENT VALUE	VALUE OF CHANGE NOTICE	ESTIMATED AGGREGATE CONTRACT VALUE
$3,339,024.00	$64,993.00	$3,404,017.00

DESCRIPTION
Effective 03/24/2025, the parties hereby agree to the following changes outlined in the attached Statement of Work: - Enhancing the Advanced Traffic Management System (ATMS) video recording module. - I-96 Corridor Construction Project Testing Support. - Adding, revising and removing requirements from Project Scope. - Extended testing support of Ramp Metering module. - Project Budget and Schedule revisions. Total Cost: $64,993.00. Please note the Contract Administrator has been changed to Corbin Montry. Please note a Program Manager has been changed to Ben Schimberg. All other terms, conditions, specifications and pricing remain the same. Per contractor and agency agreement, and DTMB Central Procurement Services approval.

Program Managers

for

Multi-Agency and Statewide Contracts

AGENCY	NAME	PHONE	EMAIL
DTMB	Dave Work	517-719-2250	WorkD@michigan.gov
MDOT	Benjamin Schimberg	517-243-0766	SchimbergB@michigan.gov

STATE OF MICHIGAN
PROCUREMENT
Michigan.gov/MiProcurement

STATEMENT OF WORK - IT CHANGE NOTICE

Project Title: MDOT – ATMS Next Gen Scope, Video, and I-96 Support	**Period of Coverage:** 10/11/24 – 10/31/25
Requesting Department: MDOT – Intelligent Transportation Systems Program Office	**Date:** 10/11/24
Agency Project Manager: Ben Schimberg	**Phone:** 517-243-0766
DTMB Project Manager: Dave Work	**Phone:** 517-719-2250

Brief description of services to be provided:

MDOT is requesting scope, schedule, and budget changes to support the implementation of ATMS Next Gen.

BACKGROUND:

The ATMS Next Gen project is implementing software enhancements to the existing State-hosted ATMS software to integrate MDOT's Intelligent Transportation System (ITS) devices. ATMS will provide MDOT's Transportation Operation Centers (TOCs) the ability to operate, monitor, and manage ITS devices to support the real-time management of MDOT's roadways.

The project is delivering enhancements in 5 separate builds. This document is addressing changes (deletions, additions and updates) to the project requirements for the 5th and final build of the project. Significant changes to the video recording module and additional support for testing of Ramp Metering are also included.

PROJECT OBJECTIVE:

- Project Scope Revisions:
  - Requirements to be removed from project scope
  - Requirements to be revised in project scope
  - Requirement to be enhanced in project scope
  - Requirements to be added to project scope
- Project Budget Revisions
- Project Schedule Revisions

Project Scope Revisions:
Requirements to be removed from project scope:

- Requirement 4.4
  - Remove: The ATMS must timestamp and record all activities and commands performed within the software, both manual and automated features. The ATMS

must provide the ability for an authorized user to configure the ATMS to not record specific activities and commands (e.g., PTZ commands).

- Requirement 6.15
  - Remove: The ATMS should provide the ability to create a map view on demand by geo-fencing an area (graying out the area outside of the selected area) for use in managing incidents and/or events.
- Requirement 9.11.2
  - Remove: Manually override the location of a portable CCTV unit.
- Requirement 11.12
  - Remove (Cost $25,945): The ATMS should capture and display wrong way driving detection events detected by vehicle detection systems, by direction and lane for of all lanes in each direction at vehicle detector locations.

- Requirement 12.60
  - Remove: The ATMS must auto-generate suggested responses based on real-time weather notifications provided by NWS. Automated responses may include DMS messaging, CCTV camera preset, variable speed advisory, etc.
- Requirement 19.4
  - Remove (Cost $35,977): The ATMS should provide call-tracking capable of interfacing with Voice over Internet Protocol (VOIP) phone systems with the ability to populate incoming and outgoing call information into the call log without action by the Traffic Operations Specialist, such as the phone number and time the call was made or received. The State of Michigan currently utilizes the Cisco Unified Communications Manager version 12.5 for its VOIP phone systems.
- Requirement 20.3
  - Remove: The ATMS must integrate with social media, at a minimum Twitter, to communicate planned event, incident, and traveler information with the traveling public. The ATMS must prepopulate a social media message based on event details for a user to review, edit, and confirm prior to posting to social media.

Requirements to be <u>revised</u> in project scope:

- Requirement 12.7
  - Partial Removal: The ATMS must allow a response plan to use any type of device, such as posting a message to a DMS ~~and repositioning a CCTV camera).~~
- Requirement 7.10
  - Partial Removal: The ATMS user interface must provide the ability to filter field device icons by type, subtype, designated favorites~~., and a metric for frequently used devices (e.g., number of times accessed, duration of time the device was actively in use).~~
- Requirement 12.16
  - Partial Removal: The ATMS must have the ability of scheduling messages to be posted and removed on individual or a group of DMS with full recurrence capabilities in typical scheduling functions such as time of day (TOD), day of week (DOW), day of month (DOM), and day of year (DOY), ~~and holidays~~.
- Requirement 12.44

  - Partial Removal: The ATMS must auto-generate suggested responses based on real-time weather notifications provided by NWS. Automated responses may include DMS messaging, ~~CCTV camera preset,~~ variable speed advisory, etc.
- Requirement 13.10
  - Partial Removal: The ATMS must not allow an event to be ~~cleared~~ terminated if there are required fields that are incomplete. Required fields must be configurable (not hard coded) and shall be easily modified for what fields are populated.
- Requirement 13.24
  - Revised Requirement: The ATMS must provide the ability to automatically associate an event with a work zone if it occurs within the boundary of an active work zone event. Parsons changed "Nearby Work Zone" to "Work Zone Related"
- Requirement 13.32
  - Partial Removal: The ATMS must have the ability to automatically generate an event based upon inputs from third-party systems including SSP, Weather Feed, ~~Waze,~~ etc.
- Requirement 15.8
  - Partial Removal: The ATMS must provide the ability to dismiss, acknowledge, and/or combine alerts associated with an event via the GUI ~~and SMS/email~~.
- Requirement 18.5
  - Partial Removal: The ATMS should provide the ability to generate reports which compares current vs. historical travel conditions. Historical travel condition data should be available as defined in the MDOT ITS/TOC Retention Schedule.

Requirement to be enhanced in project scope:

- Enhance Requirement 9.10 (Cost $43,502): The ATMS should be able to record and archive CCTV camera streaming video ~~of a rolling or continuous user defined period~~ on-demand with the requirements listed below:

ID	CCTV Video Recording Requirements
1	The ATMS must not inhibit any other CCTV functionality or software capability while video recording is occurring.
2	The ATMS must allow an operator to pre-schedule video recording start and stop times by CCTV camera.
3	The ATMS must provide an operator the option to select a CCTV preset when pre-scheduling a recording and implement that preset at the video recording start time.
4	The ATMS must allow an operator to cancel a pre-scheduled video recording prior to the video recording start time.
5	The ATMS must allow an operator to start and stop a CCTV video recording on demand.
6	The ATMS must allow an operator to stop any active recording, whether pre-scheduled or an on-demand recording.
7	The ATMS must stop an on-demand video recording if the length of recording reaches a system defined maximum duration limit (e.g., 48 hours). The maximum duration limit must be able to be adjusted by an authorized user.

8	The ATMS must notify operators upon accessing a CCTV and continuously while open, that the CCTV is actively being recorded, such as a red "recording" dot.
9	The ATMS must allow an operator to view the following information during an active recording: - The operator that started the recording - If the recording was pre-scheduled or started on-demand - If pre-scheduled, identify the scheduled stop date/time This information must not be captured in the recording (e.g., box that displays when hovering over red “recording” dot).
10	The ATMS must log video recording details with each video recording file, which includes but is not limited to: CCTV ID, MDOT Region, recording start date/time, recording end date/time, duration of recording, user that started/schedule recording, user that ended recording, recording category (using dropdown options), user entered description, user entered recording notes, and file size.
9	The ATMS must allow an operator to assign a recording category (using predefined categories) and enter a description and recording notes to a video recording.
10	The ATMS must allow an authorized user to view the video log of all available recordings.
11	The ATMS must allow an authorized user to sort and filter the list of available videos by CCTV ID, MDOT Region, recording start date/time, recording end date/time, duration of recording, user that started/schedule recording, user that ended recording, recording category, and file size.
12	The ATMS must allow an authorized user to perform a word search of the user entered description and recording notes.
13	The ATMS must allow an authorized user to play back available video recordings.
14	The ATMS must provide the ability to limit the number of CCTV cameras that are able to record simultaneously (i.e. 10 CCTV cameras). The maximum number of CCTV cameras that can record simultaneously must be able to be adjusted by an authorized user.
15	The ATMS must store video recordings and the associated information log in accordance with MDOT's retention policy.
16	The ATMS must provide the ability to create and save ad-hoc monthly reports of all available video recordings and associated information log.
17	The ATMS must allow an authorized user (i.e. supervisor) to delete videos via the ATMS user interface.
18	The ATMS must allow an authorized user (i.e. supervisor) to view the remaining video storage space via the ATMS user interface.
19	The ATMS must notify an authorized user (i.e. admin) if the video storage space has reached the remaining capacity threshold (i.e. 5% storage remaining). The video storage remaining capacity threshold must be able to be adjusted by an authorized user (i.e. admin).
20	The ATMS must notify an operator that the video storage space has reached the remaining capacity threshold when the following actions are performed: • When an operator pre-schedules a video recording.

	• When an operator attempts to start an on-demand recording.
21	The ATMS must automatically stop and save an active recording if the video storage space is exceeded during a video recording.
22	The ATMS must allow an authorized user to transcode one or more available videos to a lower bit rate.

Requirements to be <u>added</u> to project scope:

- New Requirement #1: Make the Region and Roadway fields mandatory in the DSS Library DMS message window. Note: Only ADMINS can currently view and edit DSS templates.
    - Parsons Time and Cost estimate:
        - Cost estimate: $4,160.00

- New Requirement #2: Include Surface friction in the plot options for ESS devices.
    - Parsons Time and Cost estimate:
        - Cost estimate: $6,656.00

<u>I-96 Corridor Construction Project Testing Support:</u>

The I-96 construction project requires the support of the vendor, Parsons for configuration, testing and implementation of flex lane and ramp metering technology on the I-96 corridor. Additional activities requiring Parsons support include: Meeting support for MDOT and other consultants, Dot stand-in downloads and testing of gantry signs, Onsite support before go-live, Open to Traffic onsite support.

Total for above activities: <u>$26,127.00</u>

<u>Ramp Metering - Shutdown Gap Approach with Enabled Stop Demand Detector Mode:</u>

The requested enhancement involves configuring the ramp meter to transition between metered and non-metered states based on the actuations of the demand detector. Specifically, a value between 1 and 10 seconds can be set for the ramp meter to monitor the time between demand detector actuations. If the time between actuations exceeds the set value, the ramp meter will transition to a non-metered state (yellow flash). Conversely, if the time between actuations does not exceed the set value, the ramp meter will remain in a metered state. The main reason for proposing this enhancement is to prevent the ramp meter from transitioning abruptly from metering to non-metering state, which could cause unsafe merging conditions on the ramp. This enhancement ensures that the ramp meter controller waits until the ramp clears before transitioning to a non-metering state, addressing the client's safety concerns.

Currently, the system uses the enabledCall Demand Detector Mode. In this mode, if a demand detector fails, the Shutdown gap will never reach the configured value, necessitating manual intervention to switch the meter to yellow flash. To support the main enhancement of the shutdown gap approach and ensure smooth operation, we propose switching to the enabledStop Demand Detector Mode, similar to the approach used by INDOT. In this mode, if a demand detector fails, the meter will automatically transition to yellow flash after the failure threshold is reached, even during regular metering operations. This change is a necessary step to implement the main safety enhancement effectively.

This enhancement primarily aims to improve safety by preventing abrupt transitions from metering to non-metering states, thereby addressing concerns related to unsafe merging conditions on the

ramp. The additional task of ensuring automatic transitions in the event of demand detector failures supports the main enhancement, ensuring its effective implementation and enhancing overall traffic management efficiency.

Parsons is requested to develop firmware changes, create and execute test scenarios for local operations as well as ATMS control, and deploy enhancements described above to ramp meter controllers in the I-96 Corridor Project.

Total for above activities:	$12,200.00

Project Budget Revisions:

The contract value will be increased by $64,993.00 to accommodate the changes to the requirements.

Vendor cost estimates for the requirements:

• Requirement 9.10 reduction:	$ - 43,502.00
• Requirement 11.12 reduction:	$ - 21,733.00
• Requirement 19.4 reduction:	$ - 35,977.00
• New Requirement #1:	$ 4,160.00
• New Requirement #2:	$ 6,656.00
• Revised Video Recording Requirements:	$ 117,062.00
• I-96 Corridor Testing Support:	$ 26,127.00
• I-96 Ramp Meter Development:	$ 12,200.00
Total Change Notice:	**$ 64,993.00**

Project Schedule Revisions:

To accommodate the changes in the project scope, an additional 3-months are required for delivery and implementation of the requirements into the state's QA environment. The additional time is needed for QA and UAT testing, implementation activities and project closure.

SCOPE OF WORK:

The scope of work includes development effort to implement additional requirements, meetings with MDOT and DTMB, and support of installation and testing of all modules and enhancements detailed above.

TASKS:

Technical development is needed from Parsons for the above requirements. DTMB support will also be required for the installation of the software, testing and production implementation.

DELIVERABLES:

Deliverables will include the software enhancements to satisfy the Build-5 requirements of the project. Parsons will provide technical and administrative support for these items, consistent with what has been provided with the first four builds of the project. Release notes, test plans, testing support, installation guide and back-out plans to support the implementation.

ACCEPTANCE CRITERIA:

The vendor will provide a Build-5 Test plan for both QA and UAT testing that addresses all the requirements in Build-5. Testing and acceptance will follow the same processes used in the first four builds.

Deliverables will not be considered complete until the Agency and DTMB Project Manager have formally accepted them.

PROJECT CONTROL AND REPORTS:

The Core Team will continue to meet on a weekly basis to monitor project process. At the appropriate times there will be weekly QA and UAT testing touchpoints to monitor and discuss progress during testing.

PAYMENT SCHEDULE:

Payment will be consistent with processes used during the first four builds of the project.

- Vendor payment will be made upon receipt of software
- A final payment will be made upon production implementation and final acceptance of the software

Payments will be made at the time of Solution Integration and Acceptance of the software and final payment will be made at Integration Acceptance. DTMB will pay CONTRACTOR upon receipt of properly completed invoice(s) which shall be submitted to the billing address on the State issued purchase order not more often than monthly. DTMB Accounts Payable area will coordinate obtaining Agency and DTMB Project Manager approvals. All invoices should reflect actual work completed by payment date and must be approved by the Agency and DTMB Project Manager prior to payment. The invoices shall describe and document to the State's satisfaction a description of the work performed, the progress of the project, and fees. When expenses are invoiced, receipts will need to be provided along with a detailed breakdown of each type of expense.
Payment shall be considered timely if made by DTMB within forty-five (45) days after receipt of properly completed invoices.

Payment Schedule Milestones:

- Solution Integration and Acceptance – 50%
- Integration Acceptance – 50%

Payment shall be considered timely if made by DTMB within forty-five (45) days after receipt of properly completed invoices.

EXPENSES:

The State will NOT pay for any travel expenses, including hotel, mileage, meals, parking, etc.

PROJECT CONTACTS:

The designated Agency Project Manager is:
Name: Ben Schimberg
Department: Transportation

Area: Bureau of Field Services, TSMO
Address: 8885 Ricks Rd
City/State/Zip: Lansing, Michigan 48917
Phone Number: 517-243-0766
Email Address: SchimbergB@michigan.gov

The designated DTMB Project Manager(s) is:
Name: Dave Work
Department: Technology, Management, and Budget
Area: Agency Services supporting MDOT
Building/Floor: Van Wagoner Building 3rd Floor
Address: 425 West Ottawa Street
City/State/Zip: Lansing, Michigan-48821
Phone Number: 517-719-2250
Email Address: WorkD@michigan.gov

AGENCY RESPONSIBILITIES:

Review and approval of the deliverables and submitted invoice(s).

LOCATION OF WHERE THE WORK IS TO BE PERFORMED:

All work completed by the vendor staff will be at their office physical or remote location(s), or on site when mutually agreed.

EXPECTED CONTRACTOR WORK HOURS AND CONDITIONS:

Work hours are not to exceed eight (8) hours a day, forty (40) hours a week. Normal working hours of 8:00 am to 5:00 pm are to be observed unless otherwise agreed to in writing.

No overtime will be permitted.

STATE OF MICHIGAN PROCUREMENT

Department of Technology Management & Budget
320 South Walnut Street
PO Box 30026
Lansing, MI 48909

NOTICE OF CONTRACT

NOTICE OF CONTRACT NO. **230000000396**
between
THE STATE OF MICHIGAN
and

CONTRACTOR	
	Parsons Transportation Group Inc. of Michigan
	2677 Central Park Blvd. Suite 275
	Southfield, MI 48076
	Joseph Brahm
	262-391-8056
	joseph.brahm@parsons.com
	CV0017188

STATE			
	Program Manager	Multi	Multi
	Contract Administrator	Christopher Martin	DTMB
		517-643-2833	
		martinc20@michigan.gov	

CONTRACT SUMMARY			
DESCRIPTION: Advanced Traffic Management System			
INITIAL EFFECTIVE DATE	**INITIAL EXPIRATION DATE**	**INITIAL AVAILABLE OPTIONS**	**EXPIRATION DATE BEFORE CHANGE(S) NOTED BELOW**
1/5/2023	1/4/2028	5, one-year	1/4/2028
PAYMENT TERMS		**DELIVERY TIMEFRAME**	
Net 45			
ALTERNATE PAYMENT OPTIONS			**EXTENDED PURCHASING**
☐ P-card ☐ Payment Request (PRC) ☐ Other			☒ Yes ☐ No
MINIMUM DELIVERY REQUIREMENTS			
MISCELLANEOUS INFORMATION			
ESTIMATED CONTRACT VALUE AT TIME OF EXECUTION			**$3,339,024.00**

Program Managers

for

Multi-Agency and Statewide Contracts

AGENCY	NAME	PHONE	EMAIL
MDOT	Joe McAttee	517-636-6058	mcatteej@michigan.gov
DTMB	Dave Work	517-719-2250	workd@michigan.gov

FOR THE CONTRACTOR:

Company Name

Authorized Agent Signature

Authorized Agent (Print or Type)

Date

FOR THE STATE:

Signature

Name & Title

Agency

Date

STATE OF MICHIGAN

SOFTWARE TERMS AND CONDITIONS

These Terms and Conditions, together with all Schedules (including the Statement(s) of Work), Exhibits and any other applicable attachments or addenda (Collectively this "Contract") are agreed to between the State of Michigan (the "**State**") and Parsons Transportation Group, Inc. of Michigan ("**Contractor**"), A MICHIGAN CORPORATION. This Contract is effective on 1/5/2023 ("**Effective Date**"), and unless terminated, will expire on 1/4/2028 (the "**Term**").

This Contract may be renewed for up to five additional one-year period(s). Renewal is at the sole discretion of the State and will automatically extend the Term of this Contract. The State will document its exercise of renewal options via Contract Change Notice.

1. Definitions. For the purposes of this Contract, the following terms have the following meanings:

"**Acceptance**" has the meaning set forth in **Schedule I**.

"**Affiliate**" of a Person means any other Person that directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such Person. For purposes of this definition, the term "control" (including the terms "controlled by" and "under common control with") means the direct or indirect ownership of more than fifty percent (50%) of the voting securities of a Person.

"**Allegedly Infringing Materials**" has the meaning set forth in **Section 17.2(b)**.

"**Approved Third Party Components**" means all third party components, including Open-Source Components, that are included in or used in connection with the Software and are specifically identified by Contractor in the Contractor's Bid Response or as part of the State's Security Accreditation Process defined in Schedule E – Data Security Schedule.

"**Authorized Users**" means all Persons authorized by the State to access and use the Software under this Contract, subject to the maximum number of users specified in the applicable Statement of Work.

"**Business Day**" means a day other than a Saturday, Sunday or other day on which the State is authorized or required by law to be closed for business.

"**Business Requirements Specification**" means the initial specification setting forth the State's business requirements regarding the features and functionality of the Software, as set forth in a Statement of Work.

"Change" has the meaning set forth in **Section 2.2.**

"Change Notice" has the meaning set forth in **Section 2.2(b).**

"Change Proposal" has the meaning set forth in **Section 2.2(a).**

"Change Request" has the meaning set forth in **Section 2.2.**

"Confidential Information" has the meaning set forth in **Section 22.1.**

"**Configuration**" means State-specific changes made to the Software without Source Code or structural data model changes occurring.

"**Contract**" has the meaning set forth in the preamble.

"**Contract Administrator**" is the individual appointed by each party to (a) administer the terms of this Contract, and (b) approve any Change Notices under this Contract. Each party's Contract Administrator will be identified in a Statement of Work.

"**Contractor**" has the meaning set forth in the preamble.

"**Contractor's Bid Response**" means the Contractor's proposal submitted in response to the Solicitation Type.

"**Contractor Hosted**" means the Hosted Services are provided by Contractor or one or more of its Permitted Subcontractors.

"**Contractor Personnel**" means all employees of Contractor or any subcontractors or Permitted Subcontractors involved in the performance of Services hereunder.

"**Contractor Project Manager**" means the individual appointed by Contractor and identified in a Statement of Work to serve as the primary contact with regard to services, to monitor and coordinate the day-to-day activities of this Contract, and to perform other duties as may be further defined in this Contract, including an applicable Statement of Work.

"**Customization**" means State-specific changes to the Software's underlying Source Code or structural data model changes.

"**Deliverables**" means the Software, and all other documents and other materials that Contractor is required to or otherwise does provide to the State under this Contract and otherwise in connection with any Services, including all items specifically identified as Deliverables in a Statement of Work and all Work Product.

"**Deposit Material**" refers to material required to be deposited pursuant to **Section 28**.

"**Documentation**" means all user manuals, operating manuals, technical manuals and any other instructions, specifications, documents or materials, in any form or media, that describe the functionality, installation, testing, operation, use, maintenance, support, technical or other components, features or requirements of the Software.

"**DTMB**" means the Michigan Department of Technology, Management and Budget.

"**Effective Date**" has the meaning set forth in the preamble.

"**Fees**" means the fees set forth in the Pricing Schedule attached as **Schedule B**.

"**Financial Audit Period**" has the meaning set forth in **Section 23.1**.

"**Harmful Code**" means any software, hardware or other technologies, devices or means, the purpose or effect of which is to: (a) permit unauthorized access to, or to destroy, disrupt, disable, encrypt, modify, copy, or otherwise harm or impede in any manner, any (i) computer, software, firmware, data, hardware, system or network, or (ii) any application or function of any of the foregoing or the integrity, use or operation of any data Processed thereby; or (b) prevent the State or any Authorized User from accessing or using the Services as intended by this Contract, and includes any virus, bug, trojan horse, worm, backdoor or other malicious computer code and any time bomb or drop dead device.

"**HIPAA**" has the meaning set forth in **Section 21.1**.

"**Hosted Services**" means the hosting, management and operation of the Operating Environment, Software, other services (including support and subcontracted services), and related resources for remote electronic access and use by the State and its Authorized Users, including any services and facilities related to disaster recovery obligations.

"**Implementation Plan**" means the schedule included in a Statement of Work setting forth the sequence of events for the performance of Services under a Statement of Work, including the Milestones and Milestone Dates.

"**Intellectual Property Rights**" means all or any of the following: (a) patents, patent disclosures, and inventions (whether patentable or not); (b) trademarks, service marks, trade dress, trade names, logos, corporate names, and domain names, together with all of the associated goodwill; (c) copyrights and copyrightable works (including computer programs), mask works and rights in data and databases; (d) trade secrets, know-how and other confidential information; and (e) all other intellectual property rights, in each case whether registered or unregistered and including all applications for, and renewals or extensions of, such rights, and all similar or equivalent rights or forms of protection provided by applicable law in any jurisdiction throughout the world.

"**Key Personnel**" means any Contractor Personnel identified as key personnel in the Contract.

"**Loss or Losses**" means all losses, including but not limited to, damages, liabilities, deficiencies, claims, actions, judgments, settlements, interest, awards, penalties, fines, costs or expenses of whatever kind, including reasonable attorneys' fees and the costs of enforcing any right to indemnification hereunder and the cost of pursuing any insurance providers.

"**Maintenance Release**" means any update, upgrade, release or other adaptation or modification of the Software, including any updated Documentation, that Contractor may generally provide to its licensees from time to time during the Term, which may contain, among other things, error corrections, enhancements, improvements or other changes to the user interface, functionality, compatibility, capabilities, performance, efficiency or quality of the Software.

"**Milestone**" means an event or task described in the Implementation Plan under a Statement of Work that must be completed by the corresponding Milestone Date.

"**Milestone Date**" means the date by which a particular Milestone must be completed as set forth in the Implementation Plan under a Statement of Work.

"**New Version**" means any new version of the Software, including any updated Documentation, that the Contractor may from time to time introduce and market generally as a distinct licensed product, as may be indicated by Contractor's designation of a new version number.

"**Open-Source Components**" means any software component that is subject to any open-source copyright license agreement, including any GNU General Public License or GNU Library or Lesser Public License, or other obligation, restriction or license agreement that substantially conforms to the Open Source Definition as prescribed by the Open Source Initiative or otherwise may require disclosure or licensing to any third party of any source code with which such software component is used or compiled.

"**Operating Environment**" means, collectively, the platform, environment and conditions on, in or under which the Software is intended to be installed and operate, as set forth in a Statement of Work, including such structural, functional and other features, conditions and components as hardware, operating software, system architecture, configuration, computing hardware, ancillary equipment, networking, software, firmware, databases, data, and electronic systems (including database management systems).

"PAT" means a document or product accessibility template, including any Information Technology Industry Council Voluntary Product Accessibility Template or VPAT®, that specifies how information and software products, such as websites, applications, software and associated content, conform to WCAG 2.0 Level AA.

"**Permitted Subcontractor**" means any third party hired by Contractor to perform Services for the State under this Contract or have access to State Data.

"**Person**" means an individual, corporation, partnership, joint venture, limited liability company, governmental authority, unincorporated organization, trust, association or other entity.

"**Pricing Schedule**" means the schedule attached as **Schedule B.**

"Process" means to perform any operation or set of operations on any data, information, material, work, expression or other content, including to (a) collect, receive, input, upload, download, record, reproduce, store, organize, combine, log, catalog, cross-reference, manage, maintain, copy, adapt, alter, translate or make other improvements or derivative works, (b) process, retrieve, output, consult, use, disseminate, transmit, submit, post, transfer, disclose or otherwise provide or make available, or (c) block, erase or destroy. **"Processing"** and **"Processed"** have correlative meanings.

"**Representatives**" means a party's employees, officers, directors, partners, shareholders, agents, attorneys, successors and permitted assigns.

"**RFP**" means the State's request for proposal designed to solicit responses for Services under this Contract.

"**Services**" means any of the services, including but not limited to, Hosted Services, Contractor is required to or otherwise does provide under this Contract.

"**Service Level Agreement**" means the schedule attached as **Schedule D**, setting forth the Support Services Contractor will provide to the State, and the parties' additional rights and obligations with respect thereto.

"**Site**" means the physical location designated by the State in, or in accordance with, this Contract or a Statement of Work for delivery and installation of the Software.

"**Software**" means Contractor's software as set forth in a Statement of Work, and any Maintenance Releases or New Versions provided to the State and any Customizations or Configurations made by or for the State pursuant to this Contract, and all copies of the foregoing permitted under this Contract.

"**Source Code**" means the human readable source code of the Software to which it relates, in the programming language in which the Software was written, together with all related flow charts and technical documentation, including a description of the procedure for generating object code, all of a level sufficient to enable a programmer reasonably fluent in such programming language to understand, build, operate, support, maintain and develop modifications, upgrades, updates, adaptations, enhancements, new versions and other derivative works and improvements of, and to develop computer programs compatible with, the Software.

"**Specifications**" means, for the Software, the specifications collectively set forth in the Business Requirements Specification, Technical Specification, Documentation, RFP or Contractor's Bid Response, if any, for such Software, or elsewhere in a Statement of Work.

"**State**" means the State of Michigan.

"**State Data**" has the meaning set forth in **Section 21.1**.

"**State Hosted**" means the Hosted Services are not provided by Contractor or one or more of its Permitted Subcontractors.

"**State Materials**" means all materials and information, including documents, data, know-how, ideas, methodologies, specifications, software, content and technology, in any form or media, directly or indirectly provided or made available to Contractor by or on behalf of the State in connection with this Contract.

"State Program Managers" are the individuals appointed by the State, or their designees, to (a) monitor and coordinate the day-to-day activities of this Contract; (b) co-sign off on Acceptance of the Software and other Deliverables; and (c) perform other duties as may be specified in a Statement of Work Program Managers will be identified in a Statement of Work.

"State Systems" means the information technology infrastructure, including the computers, software, databases, electronic systems (including database management systems) and networks, of the State or any of its designees.

"**Statement of Work**" means any statement of work entered into by the parties and incorporated into this Contract. The initial Statement of Work is attached as **Schedule A**.

"**Stop Work Order**" has the meaning set forth in **Section 15**.

"**Support Services**" means the software maintenance and support services Contractor is required to or otherwise does provide to the State under the Service Level Agreement.

"**Technical Specification**" means, with respect to any Software, the document setting forth the technical specifications for such Software and included in a Statement of Work.

"**Term**" has the meaning set forth in the preamble.

"**Testing Period**" has the meaning set forth in **Section 9.1(b)**.

"**Transition Period**" has the meaning set forth in **Section 16.3**.

"**Transition Responsibilities**" has the meaning set forth in **Section 16.3**.

"**Unauthorized Removal**" has the meaning set forth in **Section 2.5(b)**.

"**Unauthorized Removal Credit**" has the meaning set forth in **Section 2.5(c)**.

"**User Data**" means all data, information and other content of any type and in any format, medium or form, whether audio, visual, digital, screen, GUI or other, that is input, uploaded to, placed into or collected, stored, Processed, generated or output by any device, system or network by or on behalf of the State, including any and all works, inventions, data, analyses and other information and materials resulting from any use of the Software by or on behalf of the State under this Contract, except that User Data does not include the Software or data, information or content, including any GUI, audio, visual or digital or other display or output, that is generated automatically upon executing the Software without additional user input without the inclusion of user derived Information or additional user input.

"**Warranty Period**" means the ninety (90) calendar-day period commencing on the date of the State's Acceptance of the Software and for which Support Services are provided free of charge.

"WCAG 2.0 Level AA" means level AA of the World Wide Web Consortium Web Content Accessibility Guidelines version 2.0.

"**Work Product**" means all State-specific deliverables that Contractor is required to, or otherwise does, provide to the State under this Contract including but not limited to Customizations, application programming interfaces, computer scripts, macros, user interfaces, reports, project management documents, forms, templates, and other State-specific documents and related materials together with all ideas, concepts, processes, and methodologies developed in connection with this Contract whether or not embodied in this Contract.

2. Duties of Contractor. Contractor will provide Services and Deliverables pursuant to Statement(s) of Work entered into under this Contract. Contractor will provide all Services and Deliverables in a timely, professional manner and in accordance with the terms, conditions, and Specifications set forth in this Contract and the Statement(s) of Work.

2.1 Statement of Work Requirements. No Statement of Work will be effective unless signed by each party's Contract Administrator. The term of each Statement of Work will commence on the parties' full execution of a Statement of Work and terminate when the parties have fully performed their obligations. The terms and conditions of this Contract will apply at all times to any Statements of Work entered into by the parties and incorporated into this Contract. The State will have the right to terminate such Statement of Work as set forth in **Section 16**. Contractor acknowledges that time is of the essence with respect to Contractor's obligations under each Statement of Work and agrees that prompt and timely performance of all such obligations in accordance with this Contract and the Statements of Work (including the Implementation Plan and all Milestone Dates) is strictly required.

2.2 Change Control Process. The State may at any time request in writing (each, a "**Change Request**") changes to a Statement of Work, including changes to the Services and Implementation Plan (each, a "**Change**"). Upon the State's submission of a Change Request, the parties will evaluate and implement all Changes in accordance with this **Section 2.2**.

(a) As soon as reasonably practicable, and in any case within twenty (20) Business Days following receipt of a Change Request, Contractor will provide the State with a written proposal for implementing the requested Change ("**Change Proposal**"), setting forth:

(i) a written description of the proposed Changes to any Services or Deliverables;

(ii) an amended Implementation Plan reflecting: (A) the schedule for commencing and completing any additional or modified Services or Deliverables; and (B) the effect of such Changes, if any, on completing any other Services under a Statement of Work;

(iii) any additional State Resources Contractor deems necessary to carry out such Changes; and

(iv) any increase or decrease in Fees resulting from the proposed Changes, which increase or decrease will reflect only the increase or decrease in time and expenses Contractor requires to carry out the Change.

(b) Within thirty (30) Business Days following the State's receipt of a Change Proposal, the State will by written notice to Contractor, approve, reject, or propose modifications to such Change Proposal. If the State proposes modifications, Contractor must modify and re-deliver the Change Proposal reflecting such modifications, or notify the State of any disagreement, in which event the parties will negotiate in good faith to resolve their disagreement. Upon the State's approval of the Change Proposal or the parties' agreement on all proposed modifications, as the case may be, the parties will execute a written agreement to the Change Proposal ("**Change Notice**"), which Change Notice will be signed by the State's Contract Administrator and will constitute an amendment to a Statement of Work to which it relates; and

(c) If the parties fail to enter into a Change Notice within fifteen (15) Business Days following the State's response to a Change Proposal, the State may, in its discretion:

(i) require Contractor to perform the Services under a Statement of Work without the Change;

(ii) require Contractor to continue to negotiate a Change Notice;

(iii) initiate a Dispute Resolution Procedure; or

(iv) notwithstanding any provision to the contrary in a Statement of Work, terminate this Contract under **Section 16.1**.

(d) No Change will be effective until the parties have executed a Change Notice. Except as the State may request in its Change Request or otherwise in writing, Contractor must continue to perform its obligations in accordance with a Statement of Work pending negotiation and execution of a Change Notice. Contractor will use its best efforts to limit any delays or Fee increases from any Change to those necessary to perform the Change in accordance with the applicable Change Notice. Each party is responsible for its own costs and expenses of preparing, evaluating, negotiating, and otherwise processing any Change Request, Change Proposal, and Change Notice.

(e) The performance of any functions, activities, tasks, obligations, roles and responsibilities comprising the Services as described in this Contract are considered part of the Services and, thus, will not be considered a Change. This includes the delivery of all Deliverables in accordance with their respective Specifications, and the diagnosis and correction of Non-Conformities discovered in Deliverables prior to their Acceptance by the State or, subsequent to their Acceptance by the State, as necessary for Contractor to fulfill its associated warranty requirements and its Support Services under this Contract.

(f) Contractor may, on its own initiative and at its own expense, prepare and submit its own Change Request to the State. However, the State will be under no obligation to approve or otherwise respond to a Change Request initiated by Contractor.

2.3 Contractor Personnel.

(a) Contractor is solely responsible for all Contractor Personnel and for the payment of their compensation, including, if applicable, withholding of income taxes, and the payment and withholding of social security and other payroll taxes, unemployment insurance, workers' compensation insurance payments and disability benefits.

(b) Prior to any Contractor Personnel performing any Services, Contractor will:

(i) ensure that such Contractor Personnel have the legal right to work in the United States;

(ii) upon request, require such Contractor Personnel to execute written agreements, in form and substance acceptable to the State, that bind such Contractor Personnel to confidentiality provisions that are at least as protective of the State's information (including all Confidential Information) as those contained in this Contract; and

(iii) upon request, or as otherwise specified in a Statement of Work, perform background checks on all Contractor Personnel prior to their assignment. The scope is at the discretion of the State and documentation must be provided as requested. Contractor is responsible for all costs associated with the requested background checks. The State, in its sole discretion, may also perform background checks on Contractor Personnel. Pursuant to Michigan law, all agencies subject to IRS Pub. 1075 are required to ask the Michigan State Police to perform

fingerprint background checks on all employees, including Contractor and subcontractor employees, who may have access to any database of information maintained by the federal government that contains confidential or personal information, including, but not limited to, federal tax information. Further, pursuant to Michigan law, any agency described above is prohibited from providing Contractors or subcontractors with the result of such background check. For more information, please see Michigan Public Act 427 of 2018.

(c) Contractor and all Contractor Personnel will comply with all rules, regulations, and policies of the State that are communicated to Contractor in writing, including security procedures concerning systems and data and remote access, building security procedures, including the restriction of access by the State to certain areas of its premises or systems, and general health and safety practices and procedures.

(d) The State reserves the right to require the removal of any Contractor Personnel found, in the judgment of the State, to be unacceptable. The State's request must be written with reasonable detail outlining the reasons for the removal request. Replacement personnel for the removed person must be fully qualified for the position. If the State exercises this right, and Contractor cannot immediately replace the removed personnel, the State agrees to negotiate an equitable adjustment in schedule or other terms that may be affected by the State's required removal.

2.4 Contractor Project Manager. Throughout the Term of this Contract, Contractor must maintain a Contractor employee acceptable to the State to serve as Contractor Project Manager, who will be considered Key Personnel of Contractor. Contractor Project Manager will be identified in a Statement of Work.

(a) Contractor Project Manager must:

(i) have the requisite authority, and necessary skill, experience, and qualifications, to perform in such capacity;

(ii) be responsible for overall management and supervision of Contractor's performance under this Contract; and

(iii) be the State's primary point of contact for communications with respect to this Contract, including with respect to giving and receiving all day-to-day approvals and consents.

(b) Contractor Project Manager must attend all regularly scheduled meetings as set forth in the Implementation Plan and will otherwise be available as set forth in a Statement of Work.

(c) Contractor will maintain the same Contractor Project Manager throughout the Term of this Contract, unless:

(i) the State requests in writing the removal of Contractor Project Manager;

(ii) the State consents in writing to any removal requested by Contractor in writing;

(iii) Contractor Project Manager ceases to be employed by Contractor, whether by resignation, involuntary termination or otherwise.

(d) Contractor will promptly replace its Contractor Project Manager on the occurrence of any event set forth in **Section 2.4(c)**. Such replacement will be subject to the State's prior written approval.

2.5 Contractor's Key Personnel.

(a) The State has the right to recommend and approve in writing the initial assignment, as well as any proposed reassignment or replacement, of any Key Personnel. Before assigning an individual to any Key Personnel

position, Contractor will notify the State of the proposed assignment, introduce the individual to the State Program Managers or their designees, and provide the State with a resume and any other information about the individual reasonably requested by the State. The State reserves the right to interview the individual before granting written approval. In the event the State finds a proposed individual unacceptable, the State will provide a written explanation including reasonable detail outlining the reasons for the rejection.

(b) Contractor will not remove any Key Personnel from their assigned roles on this Contract without the prior written consent of the State. The Contractor's removal of Key Personnel without the prior written consent of the State is an unauthorized removal ("**Unauthorized Removal**"). An Unauthorized Removal does not include replacing Key Personnel for reasons beyond the reasonable control of Contractor, including illness, disability, leave of absence, personal emergency circumstances, resignation, or for cause termination of the Key Personnel's employment. Any Unauthorized Removal may be considered by the State to be a material breach of this Contract, in respect of which the State may elect to terminate this Contract for cause under **Section 16.1**.

(c) It is further acknowledged that an Unauthorized Removal will interfere with the timely and proper completion of this Contract, to the loss and damage of the State, and that it would be impracticable and extremely difficult to determine and remedy the actual damage sustained by the State as a result of any Unauthorized Removal. Therefore, Contractor and the State agree that in the case of any Unauthorized Removal in respect of which the State does not elect to exercise its rights under **Section 16**, Contractor will issue to the State an amount equal to $25,000 per individual (each, an "**Unauthorized Removal Credit**").

(d) Contractor acknowledges and agrees that each of the Unauthorized Removal Credits assessed under **Subsection 2.5(c)** above: (i) is a reasonable estimate of and compensation for the anticipated or actual harm to the State that may arise from the Unauthorized Removal, which would be impossible or very difficult to accurately estimate; and (ii) may, at the State's option, be credited or set off against any Fees or other charges payable to Contractor under this Contract.

2.6 Subcontractors. Contractor must obtain prior written approval of the State, which consent may be given or withheld in the State's sole discretion, before engaging any Permitted Subcontractor to provide Services to the State under this Contract. Third parties otherwise retained by Contractor to provide Contractor or other clients of contractor with services are not Permitted Subcontractors, and therefore do not require prior approval by the State. Engagement of any subcontractor or Permitted Subcontractor by Contractor does not relieve Contractor of its representations, warranties or obligations under this Contract. Without limiting the foregoing, Contractor will:

(a) be responsible and liable for the acts and omissions of each such subcontractor (including such Permitted Subcontractor and Permitted Subcontractor's employees who, to the extent providing Services or Deliverables, will be deemed Contractor Personnel) to the same extent as if such acts or omissions were by Contractor or its employees;

(b) name the State a third-party beneficiary under Contractor's Contract with each Permitted Subcontractor with respect to the Services;

(c) be responsible for all fees and expenses payable to, by or on behalf of each Permitted Subcontractor in connection with this Contract, including, if applicable, withholding of income taxes, and the payment and withholding of social security and other payroll taxes, unemployment insurance, workers' compensation insurance payments and disability benefits; and

(d) notify the State of the location of the Permitted Subcontractor and indicate if it is located within the continental United States.

3. Notices. All notices and other communications required or permitted under this Contract must be in writing and will be considered given and received: (a) when verified by written receipt if sent by courier; (b) when actually received

if sent by mail without verification of receipt; or (c) when verified by automated receipt or electronic logs if sent by facsimile or email.

If to State:	If to Contractor:
Christopher Martin 525 West Allegan Street PO Box 30026 Lansing, MI 48909 martinc20@michigan.gov 517-643-2833	Joseph Brahm 650 E Algonquin Road, Suite 400 Schaumburg, IL 60173 joseph.brahm@parsons.com 262-391-8056

4. Insurance. Contractor must maintain the minimum insurances identified in the Insurance Schedule attached as **Schedule C**.

5. Software License.

5.1 **Perpetual License**. If Contractor is providing the State with a license to use its Software indefinitely, then Contractor hereby grants to the State and its Authorized Users a non-exclusive, royalty-free, perpetual, irrevocable right and license to use the Software and Documentation in accordance with the terms and conditions of this Contract, provided that:

(a) The State is prohibited from reverse engineering or decompiling the Software, making derivative works, modifying, adapting or copying the Software except as is expressly permitted by this Contract or required to be permitted by law;

(b) The State is authorized to make copies of the Software for backup, disaster recovery, and archival purposes;

(c) The State is authorized to make copies of the Software to establish a test environment to conduct Acceptance Testing;

(d) Title to and ownership of the Software shall at all times remain with Contractor and/or it's licensors, as applicable; and

(e) Except as expressly agreed in writing, the State is not permitted to sub-license the use of the Software or any accompanying Documentation.

5.2 **Subscription License.** If the Software is Contractor Hosted and Contractor is providing the State access to use its Software during the Term of the Contract only, then:

(a) Contractor hereby grants to the State, exercisable by and through its Authorized Users, a nonexclusive, royalty-free, irrevocable right and license during the Term and such additional periods, if any, as Contractor is required to perform Services under this Contract or any Statement of Work, to:

(i) access and use the Software, including in operation with other software, hardware, systems, networks and services, for the State's business purposes, including for Processing State Data;

(ii) generate, print, copy, upload, download, store and otherwise Process all GUI, audio, visual, digital and other output, displays and other content as may result from any access to or use of the Software;

(iii) prepare, reproduce, print, download and use a reasonable number of copies of the Specifications and Documentation for any use of the Software under this Contract; and

(iv) access and use the Software for all such non-production uses and applications as may be necessary or useful for the effective use of the Software hereunder, including for purposes of analysis, development, configuration, integration, testing, training, maintenance, support and repair, which access and use will be without charge and not included for any purpose in any calculation of the State's or its Authorized Users' use of the Software, including for purposes of assessing any Fees or other consideration payable to Contractor or determining any excess use of the Software as described in **Section 5.2(c)** below.

(b) License Restrictions. The State will not: (a) rent, lease, lend, sell, sublicense, assign, distribute, publish, transfer or otherwise make the Software available to any third party, except as expressly permitted by this Contract or in any Statement of Work; or (b) use or authorize the use of the Software or Documentation in any manner or for any purpose that is unlawful under applicable Law.

(c) Use. The State will pay Contractor the corresponding Fees set forth in a Statement of Work or Pricing Schedule for all Authorized Users access and use of the Software. Such Fees will be Contractor's sole and exclusive remedy for use of the Software, including any excess use.

5.3 **Certification**. To the extent that a License granted to the State is not unlimited, Contractor may request written certification from the State regarding use of the Software for the sole purpose of verifying compliance with this **Section 5.** Such written certification may occur no more than once in any twenty-four (24) month period during the Term of the Contract. The State will to respond to any such request within 45 calendar days of receipt. If the State's use is greater than contracted, Contractor may invoice the State for any unlicensed use (and related support) pursuant to the terms of this Contract at the rates set forth in **Schedule B**, and the unpaid license and support fees shall be payable in accordance with the terms of the Contract. Payment under this provision shall be Contractor's sole and exclusive remedy to cure these issues.

5.4 **State License Grant to Contractor**. The State hereby grants to Contractor a limited, non-exclusive, non-transferable license (i) to use the State's (or individual agency's, department's or division's) name, trademarks, service marks or logos, solely in accordance with the State's specifications, and (ii) to display, reproduce, distribute and transmit in digital form the State's (or individual agency's, department's or division's) name, trademarks, service marks or logos in connection with promotion of the Services as communicated to Contractor by the State. Use of the State's (or individual agency's, department's or division's) name, trademarks, service marks or logos will be specified in the applicable Statement of Work**.** Contractor is provided a limited license to State Materials for the sole and exclusive purpose of providing the Services.

6. Third Party Components. At least 30 days prior to adding new Third Party Components, Contractor will provide the State with notification information identifying and describing the addition. Throughout the Term, on an annual basis, Contractor will provide updated information identifying and describing any Approved Third Party Components included in the Software.

7. Intellectual Property Rights

7.1 Ownership Rights in Software

(a) For purposes of this **Section 7** only, the term "Software" does not include Customizations.

(b) Subject to the rights and licenses granted by Contractor in this Contract and the provisions of **Section 7.1(c)**:

(i) Contractor reserves and retains its entire right, title and interest in and to all Intellectual Property Rights arising out of or relating to the Software; and

(ii) none of the State or Authorized Users acquire any ownership of Intellectual Property Rights in or to the Software or Documentation as a result of this Contract.

(c) As between the State, on the one hand, and Contractor, on the other hand, the State has, reserves and retains, sole and exclusive ownership of all right, title and interest in and to State Materials, User Data, including all Intellectual Property Rights arising therefrom or relating thereto.

7.2 The State is and will be the sole and exclusive owner of all right, title, and interest in and to all Work Product developed exclusively for the State under this Contract, including all Intellectual Property Rights. In furtherance of the foregoing:

(a) Contractor will create all Work Product as work made for hire as defined in Section 101 of the Copyright Act of 1976; and

(b) to the extent any Work Product, or Intellectual Property Rights do not qualify as, or otherwise fails to be, work made for hire, Contractor hereby:

(i) assigns, transfers, and otherwise conveys to the State, irrevocably and in perpetuity, throughout the universe, all right, title, and interest in and to such Work Product, including all Intellectual Property Rights; and

(ii) irrevocably waives any and all claims Contractor may now or hereafter have in any jurisdiction to so-called "moral rights" or rights of *droit moral* with respect to the Work Product.

8. Software Implementation.

8.1 Implementation. Contractor will as applicable; deliver, install, configure, integrate, and otherwise provide and make fully operational the Software on or prior to the applicable Milestone Date in accordance with the criteria set forth in a Statement of Work and the Implementation Plan.

8.2 Site Preparation. Unless otherwise set forth in a Statement of Work, Contractor is responsible for ensuring the relevant Operating Environment is set up and in working order to allow Contractor to deliver and install the Software on or prior to the applicable Milestone Date. Contractor will provide the State with such notice as is specified in a Statement of Work, prior to delivery of the Software to give the State sufficient time to prepare for Contractor's delivery and installation of the Software. If the State is responsible for Site preparation, Contractor will provide such assistance as the State requests to complete such preparation on a timely basis.

9. Software Acceptance Testing

Unless otherwise specified in a Statement of Work, acceptance testing of the Software will be conducted pursuant to **Schedule I - Acceptance Testing**.

10. Non-Software Acceptance.

10.1 All other non-Software Services and Deliverables are subject to inspection and testing by the State within 30 calendar days of the State's receipt of them ("State Review Period"), unless otherwise provided in the Statement of Work. If the non-Software Services and Deliverables are not fully accepted by the State, the State will notify Contractor by the end of the State Review Period that either: (a) the non-Software Services and Deliverables are accepted but noted deficiencies must be corrected; or (b) the non-Software Services and Deliverables are rejected. If the State finds material deficiencies, it may: (i) reject the non-Software Services and Deliverables without performing

any further inspections; (ii) demand performance at no additional cost; or (iii) terminate this Contract in accordance with **Section 16.1**, Termination for Cause.

10.2 Within 10 business days from the date of Contractor's receipt of notification of acceptance with deficiencies or rejection of any non-Software Services and Deliverables, Contractor must cure, at no additional cost, the deficiency and deliver unequivocally acceptable non-Software Services and Deliverables to the State. If acceptance with deficiencies or rejection of the non-Software Services and Deliverables impacts the content or delivery of other non-completed non-Software Services and Deliverables, the parties' respective Program Managers must determine an agreed to number of days for re-submission that minimizes the overall impact to the Contract. However, nothing herein affects, alters, or relieves Contractor of its obligations to correct deficiencies in accordance with the time response standards set forth in this Contract.

10.3 If Contractor is unable or refuses to correct the deficiency within the time response standards set forth in this Contract, the State may cancel the order in whole or in part. The State, or a third party identified by the State, may provide the non-Software Services and Deliverables and recover the difference between the cost to cure and the Contract price plus an additional 10% administrative fee.

11. Assignment. Contractor may not assign this Contract to any other party without the prior approval of the State. Upon notice to Contractor, the State, in its sole discretion, may assign in whole or in part, its rights or responsibilities under this Contract to any other party. If the State determines that a novation of the Contract to a third party is necessary, Contractor will agree to the novation and provide all necessary documentation and signatures.

12. Change of Control. Contractor will notify the State, within 30 days of any public announcement or otherwise once legally permitted to do so, of a change in Contractor's organizational structure or ownership. For purposes of this Contract, a change in control means any of the following:

(a) a sale of more than 50% of Contractor's stock;

(b) a sale of substantially all of Contractor's assets;

(c) a change in a majority of Contractor's board members;

(d) consummation of a merger or consolidation of Contractor with any other entity;

(e) a change in ownership through a transaction or series of transactions;

(f) or the board (or the stockholders) approves a plan of complete liquidation.

A change of control does not include any consolidation or merger effected exclusively to change the domicile of Contractor, or any transaction or series of transactions principally for bona fide equity financing purposes. In the event of a change of control, Contractor must require the successor to assume this Contract and all of its obligations under this Contract.

13. Invoices and Payment.

13.1 Invoices must conform to the requirements communicated from time-to-time by the State. All undisputed amounts are payable within 45 days of the State's receipt. Contractor may only charge for Services and Deliverables provided as specified in Statement(s) of Work. Invoices must include an itemized statement of all charges.

13.2 The State has the right to withhold payment of any disputed amounts until the parties agree as to the validity of the disputed amount. The State will notify Contractor of any dispute within a reasonable time. Payment by the State will not constitute a waiver of any rights as to Contractor's continuing obligations, including claims for deficiencies or substandard Services and Deliverables. Contractor's acceptance of final payment by the State constitutes a waiver of all claims by Contractor against the State for payment under this Contract, other than those claims previously filed in writing on a timely basis and still disputed.

13.3 The State will only disburse payments under this Contract through Electronic Funds Transfer (EFT). Contractor must register with the State at http://www.michigan.gov/SIGMAVSS to receive electronic fund transfer payments. If Contractor does not register, the State is not liable for failure to provide payment.

13.4 Right of Setoff. Without prejudice to any other right or remedy it may have, the State reserves the right to set off at any time any amount then due and owing to it by Contractor against any amount payable by the State to Contractor under this Contract.

13.5 Taxes. The State is exempt from State sales tax for direct purchases and may be exempt from federal excise tax, if Services or Deliverables purchased under this Contract are for the State's exclusive use. Notwithstanding the foregoing, all Fees are exclusive of taxes, and Contractor is responsible for all sales, use and excise taxes, and any other similar taxes, duties and charges of any kind imposed by any federal, state, or local governmental entity on any amounts payable by the State under this Contract.

13.6 Pricing/Fee Changes. All Pricing set forth in this Contract will not be increased, except as otherwise expressly provided in this Section.

(a) The Fees will not be increased at any time except for the addition of additional licenses, the fees for which licenses will also remain firm in accordance with the Pricing set forth in the Pricing Schedule.

(b) Excluding federal government charges and terms. Contractor warrants and agrees that each of the Fees, economic or product terms or warranties granted pursuant to this Contract are comparable to or better than the equivalent fees, economic or product term or warranty being offered to any commercial or government customer of Contractor. If Contractor enters into any arrangements with another customer of Contractor to provide the products or services, available under this Contract, under more favorable prices, as the prices may be indicated on Contractor's current U.S. and International price list or comparable document, then this Contract will be deemed amended as of the date of such other arrangements to incorporate those more favorable prices, and Contractor will immediately notify the State of such Fee and formally memorialize the new pricing in a Change Notice.

14. Liquidated Damages.

14.1 The parties understand and agree that any liquidated damages (which includes but is not limited to applicable credits) set forth in this Contract are reasonable estimates of the State's damages in accordance with applicable law.

14.2 The parties acknowledge and agree that Contractor could incur liquidated damages for more than one event.

14.3 The assessment of liquidated damages will not constitute a waiver or release of any other remedy the State may have under this Contract for Contractor's breach of this Contract, including without limitation, the State's right to terminate this Contract for cause under **Section 16.1** and the State will be entitled in its discretion to recover actual damages caused by Contractor's failure to perform its obligations under this Contract. However, the State will reduce such actual damages by the amounts of liquidated damages received for the same events causing the actual damages.

14.4 Amounts due the State as liquidated damages may be set off against any Fees payable to Contractor under this Contract, or the State may bill Contractor as a separate item and Contractor will promptly make payments on such bills.

15. Stop Work Order. The State may, at any time, order the Services of Contractor fully or partially stopped for up to ninety (90) calendar days at no additional cost to the State. The State will provide Contractor a written notice detailing such suspension (a "**Stop Work Order**"). Contractor must comply with the Stop Work Order upon receipt. Within 90 days, or any longer period agreed to by Contractor, the State will either:

(a) issue a notice authorizing Contractor to resume work, or

(b) terminate this Contract. The State will not pay for any Services, Contractor's lost profits, or any additional compensation during a stop work period.

16. Termination, Expiration, Transition. The State may terminate this Contract, the Support Services, or any Statement of Work, in accordance with the following:

16.1 Termination for Cause. In addition to any right of termination set forth elsewhere in this Contract:

(a) The State may terminate this Contract for cause, in whole or in part, if Contractor, as determined by the State:

(i) endangers the value, integrity, or security of State Systems, State Data, or the State's facilities or personnel;

(ii) becomes insolvent, petitions for bankruptcy court proceedings, or has an involuntary bankruptcy proceeding filed against it by any creditor; or

(iii) breaches any of its material duties or obligations under this Contract. Any reference to specific breaches being material breaches within this Contract will not be construed to mean that other breaches are not material.

(b) If the State terminates this Contract under this **Section 16.1**, the State will issue a termination notice specifying whether Contractor must:

(i) cease performance immediately. Contractor must submit all invoices for Services accepted by the State within 30 days of the date of termination. Failure to submit an invoice within that timeframe will constitute a waiver by Contractor for any amounts due to Contractor for Services accepted by the State under this Contract, or

(ii) continue to perform for a specified period. If it is later determined that Contractor was not in breach of this Contract, the termination will be deemed to have been a termination for public interest, effective as of the same date, and the rights and obligations of the parties will be limited to those provided in **Section 16.2**.

(c) The State will only pay for amounts due to Contractor for Services accepted by the State on or before the date of termination, subject to the State's right to set off any amounts owed by the Contractor for the State's reasonable costs in terminating this Contract. Contractor must promptly reimburse to the State any Fees prepaid by the State prorated to the date of such termination, including any prepaid Fees. Further, Contractor must pay all reasonable costs incurred by the State in terminating this Contract for cause, including administrative costs, attorneys' fees, court costs, transition costs, and any costs the State incurs to procure the Services from other sources.

16.2 Termination for Public Interest. The State may immediately terminate this Contract in whole or in part, without penalty and for any reason, including but not limited to, appropriation or budget shortfalls. The termination notice will specify whether Contractor must:

(a) cease performance immediately. Contractor must submit all invoices for Services accepted by the State within 30 days of the date of termination. Failure to submit an invoice within that timeframe will constitute a waiver by Contractor for any amounts due to Contractor for Services accepted by the State under this Contract, or

(b) continue to perform in accordance with **Section 16.3**. If the State terminates this Contract for public interest, the State will pay all reasonable costs, as determined by the State, for State approved Transition Responsibilities to the extent the funds are available.

16.3 Transition Responsibilities.

(a) Upon termination or expiration of this Contract for any reason, Contractor must, for a period of time specified by the State (not to exceed 90 calendar days; the "**Transition Period**"), provide all reasonable transition assistance requested by the State, to allow for the expired or terminated portion of the Contract to continue without interruption or adverse effect, and to facilitate the orderly transfer of the Services to the State or its designees. Such transition assistance may include but is not limited to:

(i) continuing to perform the Services at the established Contract rates;

(ii) taking all reasonable and necessary measures to transition performance of the work, including all applicable Services to the State or the State's designee;

(iii) taking all necessary and appropriate steps, or such other action as the State may direct, to preserve, maintain, protect, and comply with **Section 22.5** regarding the return or destruction of State Data at the conclusion of the Transition Period; and

(iv) preparing an accurate accounting from which the State and Contractor may reconcile all outstanding accounts (collectively, the "**Transition Responsibilities**"). The Term of this Contract is automatically extended through the end of the Transition Period.

(b) Contractor will follow the transition plan attached as **Schedule G** as it pertains to both transition in and transition out activities.

17. Indemnification

17.1 General Indemnification. Contractor must defend, indemnify and hold the State, its departments, divisions, agencies, offices, commissions, officers, and employees harmless, without limitation, from and against any and all actions, claims, losses, liabilities, damages, costs, attorney fees, and expenses (including those required to establish the right to indemnification), arising out of or relating to:

(a) any breach by Contractor (or any of Contractor's employees, agents, subcontractors, or by anyone else for whose acts any of them may be liable) of any of the promises, agreements, representations, warranties, or insurance requirements contained in this Contract;

(b) any infringement, misappropriation, or other violation of any Intellectual Property Right or other right of any third party;

(c) any bodily injury, death, or damage to real or tangible personal property occurring wholly or in part due to action or inaction by Contractor (or any of Contractor's employees, agents, subcontractors, or by anyone else for whose acts any of them may be liable); and

(d) negligent acts or omissions of Contractor (or any of Contractor's employees, agents, subcontractors, or by anyone else for whose acts any of them may be liable).

17.2 Indemnification Procedure. The State will notify Contractor in writing if indemnification is sought; however, failure to do so will not relieve Contractor, except to the extent that Contractor is materially prejudiced. Contractor must, to the satisfaction of the State, demonstrate its financial ability to carry out these obligations. The State is entitled to:

(a) regular updates on proceeding status;

(b) participate in the defense of the proceeding;

(c) employ its own counsel; and to

(d) retain control of the defense, at its own cost and expense, if the State deems necessary. Contractor will not, without the State's prior written consent (not to be unreasonably withheld), settle, compromise, or consent to the entry of any judgment in or otherwise seek to terminate any claim, action, or proceeding. Any litigation activity on behalf of the State or any of its subdivisions, under this **Section 17**, must be coordinated with the Department of Attorney General. An attorney designated to represent the State may not do so until approved by the Michigan Attorney General and appointed as a Special Assistant Attorney General.

17.3 The State is constitutionally prohibited from indemnifying Contractor or any third parties.

18. Infringement Remedies.

18.1 The remedies set forth in this Section are in addition to, and not in lieu of, all other remedies that may be available to the State under this Contract or otherwise, including the State's right to be indemnified for such actions.

18.2 If any Software or any component thereof, other than State Materials, is found to be infringing or if any use of any Software or any component thereof is enjoined, threatened to be enjoined or otherwise the subject of an infringement claim, Contractor must, at Contractor's sole cost and expense:

(a) procure for the State the right to continue to use such Software or component thereof to the full extent contemplated by this Contract; or

(b) modify or replace the materials that infringe or are alleged to infringe ("**Allegedly Infringing Materials**") to make the Software and all of its components non-infringing while providing fully equivalent features and functionality.

18.3 If neither of the foregoing is possible notwithstanding Contractor's best efforts, then Contractor may direct the State to cease any use of any materials that have been enjoined or finally adjudicated as infringing, provided that Contractor will:

(a) refund to the State all amounts paid by the State in respect of such Allegedly Infringing Materials and any other aspects of the Software provided under a Statement of Work for the Allegedly Infringing Materials that the State cannot reasonably use as intended under this Contract; and

(b) in any case, at its sole cost and expense, secure the right for the State to continue using the Allegedly Infringing Materials for a transition period of up to six (6) months to allow the State to replace the affected features of the Software without disruption.

18.4 If Contractor directs the State to cease using any Software under **Section 18.3,** the State may terminate this Contract for cause under **Section 16.1**.Unless the claim arose against the Software independently of any of the actions specified below, Contractor will have no liability for any claim of infringement arising solely from:

(a) Contractor's compliance with any designs, specifications, or instructions of the State; or

(b) modification of the Software by the State without the prior knowledge and approval of Contractor.

19. Disclaimer of Damages and Limitation of Liability.

19.1 The State's Disclaimer of Damages. THE STATE WILL NOT BE LIABLE, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY OR BY STATUTE OR OTHERWISE, FOR ANY CLAIM RELATED TO OR ARISING UNDER THIS CONTRACT FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT, OR SPECIAL DAMAGES, INCLUDING WITHOUT LIMITATION LOST PROFITS AND LOST BUSINESS OPPORTUNITIES.

19.2 The State's Limitation of Liability. IN NO EVENT WILL THE STATE'S AGGREGATE LIABILITY TO CONTRACTOR UNDER THIS CONTRACT, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY OR BY STATUTE OR OTHERWISE, FOR ANY CLAIM RELATED TO OR ARISING UNDER THIS CONTRACT, EXCEED THE MAXIMUM AMOUNT OF FEES PAYABLE UNDER THIS CONTRACT.

19.3 Contractor's Limitation of Liability - IN NO EVENT WILL THE CONTRACTOR'S AGGREGATE LIABILITY TO STATE UNDER THIS CONTRACT, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY OR BY STATUTE OR OTHERWISE, FOR ANY CLAIM RELATED TO OR ARISING UNDER THIS CONTRACT, EXCEED THE MAXIMUM AMOUNT OF FEES PAYABLE UNDER THIS CONTRACT.

THE LIMITATIONS OF LIABILITY SET FORTH IN THIS SECTION DO NOT APPLY TO CONTRACTOR'S CONTRACTUAL OBLIGATIONS RELATED TO STATE DATA, INFRINGEMENT, AND/OR INDEMNIFICATION; NOR WILL ANY SUCH LIMITATION OF LIABILITY APPLY TO ANY ACTS OF GROSS NEGLIGENCE, AND/OR WILLFUL MISCONDUCT OF CONTRACTOR (TO INCLUDE ANY EMPLOYEE, SUBCONTRACTOR OR AGENT THEREOF).

20. Disclosure of Litigation, or Other Proceeding. Contractor must notify the State within 14 calendar days of receiving notice of any litigation, investigation, arbitration, or other proceeding (collectively, "**Proceeding**") involving Contractor, a Permitted Subcontractor, or an officer or director of Contractor or Permitted Subcontractor, that arises during the term of the Contract, including:

(a) a criminal Proceeding;

(b) a parole or probation Proceeding;

(c) a Proceeding under the Sarbanes-Oxley Act;

(d) a civil Proceeding involving:

(i) a claim that might reasonably be expected to adversely affect Contractor's viability or financial stability; or

(ii) a governmental or public entity's claim or written allegation of fraud; or

(e) a Proceeding involving any license that Contractor is required to possess in order to perform under this Contract.

21. State Data.

21.1 Ownership. The State's data ("**State Data**"), which will be treated by Contractor as Confidential Information, includes:

(a) User Data; and

(b) any other data collected, used, Processed, stored, or generated in connection with the Services, including but not limited to:

(i) personally identifiable information ("**PII**") collected, used, Processed, stored, or generated as the result of the Services, including, without limitation, any information that identifies an individual, such as an individual's social security number or other government-issued identification number, date of birth, address, telephone number, biometric data, mother's maiden name, email address, credit card information, or an individual's name in combination with any other of the elements here listed; and

(ii) protected health information ("**PHI**") collected, used, Processed, stored, or generated as the result of the Services, which is defined under the Health Insurance Portability and Accountability Act ("**HIPAA**") and its related rules and regulations.

21.2 State Data is and will remain the sole and exclusive property of the State and all right, title, and interest in the same is reserved by the State.

21.3 Contractor Use of State Data. Contractor is provided a limited license to State Data for the sole and exclusive purpose of providing the Services, including a license to collect, process, store, generate, and display State Data only to the extent necessary in the provision of the Services. Contractor must:

(a) keep and maintain State Data in strict confidence, using such degree of care as is appropriate and consistent with its obligations as further described in this Contract and applicable law to avoid unauthorized access, use, disclosure, or loss;

(b) use and disclose State Data solely and exclusively for the purpose of providing the Services, such use and disclosure being in accordance with this Contract, any applicable Statement of Work, and applicable law;

(c) keep and maintain State Data in the continental United States and

(d) not use, sell, rent, transfer, distribute, commercially exploit, or otherwise disclose or make available State Data for Contractor's own purposes or for the benefit of anyone other than the State without the State's prior written consent. Contractor's misuse of State Data may violate state or federal laws, including but not limited to MCL 752.795.

21.4 Discovery. Contractor will immediately notify the State upon receipt of any requests which in any way might reasonably require access to State Data or the State's use of the Software and Hosted Services, if applicable. Contractor will notify the State Program Managers or their designees by the fastest means available and also in writing. In no event will Contract provide such notification more than twenty-four (24) hours after Contractor receives the request. Contractor will not respond to subpoenas, service of process, FOIA requests, and other legal requests related to the State without first notifying the State and obtaining the State's prior approval of Contractor's proposed responses. Contractor agrees to provide its completed responses to the State with adequate time for State review, revision and approval.

21.5 Loss or Compromise of Data. In the event of any act, error or omission, negligence, misconduct, or breach on the part of Contractor that compromises or is suspected to compromise the security, confidentiality, integrity, or availability of State Data or the physical, technical, administrative, or organizational safeguards put in place by Contractor that relate to the protection of the security, confidentiality, or integrity of State Data, Contractor must, as applicable:

(a) notify the State as soon as practicable but no later than twenty-four (24) hours of becoming aware of such occurrence;

(b) cooperate with the State in investigating the occurrence, including making available all relevant records, logs, files, data reporting, and other materials required to comply with applicable law or as otherwise required by the State;

(c) in the case of PII or PHI, at the State's sole election:

(i) with approval and assistance from the State, notify the affected individuals who comprise the PII or PHI as soon as practicable but no later than is required to comply with applicable law, or, in the absence of any legally required notification period, within five (5) calendar days of the occurrence; or

(ii) reimburse the State for any costs in notifying the affected individuals;

(d) in the case of PII, provide third-party credit and identity monitoring services to each of the affected individuals who comprise the PII for the period required to comply with applicable law, or, in the absence of any legally required monitoring services, for no less than twenty-four (24) months following the date of notification to such individuals;

(e) perform or take any other actions required to comply with applicable law as a result of the occurrence;

(f) pay for any costs associated with the occurrence, including but not limited to any costs incurred by the State in investigating and resolving the occurrence, including reasonable attorney's fees associated with such investigation and resolution;

(g) without limiting Contractor's obligations of indemnification as further described in this Contract, indemnify, defend, and hold harmless the State for any and all claims, including reasonable attorneys' fees, costs, and incidental expenses, which may be suffered by, accrued against, charged to, or recoverable from the State in connection with the occurrence;

(h) be responsible for recreating lost State Data in the manner and on the schedule set by the State without charge to the State; and

(i) provide to the State a detailed plan within ten (10) calendar days of the occurrence describing the measures Contractor will undertake to prevent a future occurrence. Notification to affected individuals, as described above, must comply with applicable law, be written in plain language, not be tangentially used for any solicitation purposes, and contain, at a minimum: name and contact information of Contractor's representative; a description of the nature of the loss; a list of the types of data involved; the known or approximate date of the loss; how such loss may affect the affected individual; what steps Contractor has taken to protect the affected individual; what steps the affected individual can take to protect himself or herself; contact information for major credit card reporting agencies; and, information regarding the credit and identity monitoring services to be provided by Contractor. The State will have the option to review and approve any notification sent to affected individuals prior to its delivery. Notification to any other party, including but not limited to public media outlets, must be reviewed and approved by the State in writing prior to its dissemination.

21.6 The parties agree that any damages relating to a breach of **Section 21.6** are to be considered direct damages and not consequential damages. **Section 21** survives termination or expiration of this Contract.

22. Non-Disclosure of Confidential Information. The parties acknowledge that each party may be exposed to or acquire communication or data of the other party that is confidential, privileged communication not intended to be disclosed to third parties. This **Section 22** survives termination or expiration of this Contract.

22.1 Meaning of Confidential Information. The term "**Confidential Information**" means all information and documentation of a party that:

(a) has been marked "confidential" or with words of similar meaning, at the time of disclosure by such party;

(b) if disclosed orally or not marked "confidential" or with words of similar meaning, was subsequently summarized in writing by the disclosing party and marked "confidential" or with words of similar meaning; or,

(c) should reasonably be recognized as confidential information of the disclosing party.

The term "Confidential Information" does not include any information or documentation that was or is:

(d) in the possession of the State and subject to disclosure under the Michigan Freedom of Information Act (FOIA);

(e) already in the possession of the receiving party without an obligation of confidentiality;

(f) developed independently by the receiving party, as demonstrated by the receiving party, without violating the disclosing party's proprietary rights;

(g) obtained from a source other than the disclosing party without an obligation of confidentiality; or,

(h) publicly available when received, or thereafter became publicly available (other than through any unauthorized disclosure).

For purposes of this Contract, in all cases and for all matters, State Data is deemed to be Confidential Information.

22.2 Obligation of Confidentiality. The parties agree to hold all Confidential Information in strict confidence and not to copy, reproduce, sell, transfer, or otherwise dispose of, give or disclose such Confidential Information to third parties other than employees, agents, or subcontractors of a party who have a need to know in connection with this Contract or to use such Confidential Information for any purposes whatsoever other than the performance of this Contract. The parties agree to advise and require their respective employees, agents, and subcontractors of their obligations to keep all Confidential Information confidential. Disclosure to the Contractor's subcontractor is permissible where:

(a) the subcontractor is a Permitted Subcontractor;

(b) the disclosure is necessary or otherwise naturally occurs in connection with work that is within the Permitted Subcontractor's responsibilities; and

(c) Contractor obligates the Permitted Subcontractor in a written contract to maintain the State's Confidential Information in confidence. At the State's request, any of the Contractor's and Permitted Subcontractor's Representatives may be required to execute a separate agreement to be bound by the provisions of this **Section 22.2**.

22.3 Cooperation to Prevent Disclosure of Confidential Information. Each party must use its best efforts to assist the other party in identifying and preventing any unauthorized use or disclosure of any Confidential Information. Without limiting the foregoing, each party must advise the other party immediately in the event either party learns or has reason to believe that any person who has had access to Confidential Information has violated or intends to violate the terms of this Contract. Each party will cooperate with the other party in seeking injunctive or other equitable relief against any such person.

22.4 Remedies for Breach of Obligation of Confidentiality. Each party acknowledges that breach of its obligation of confidentiality may give rise to irreparable injury to the other party, which damage may be inadequately compensable in the form of monetary damages. Accordingly, a party may seek and obtain injunctive relief against the breach or threatened breach of the foregoing undertakings, in addition to any other legal remedies which may be available, to include, in the case of the State, at the sole election of the State, the immediate termination, without liability to the State, of this Contract or any Statement of Work corresponding to the breach or threatened breach.

22.5 Surrender of Confidential Information upon Termination. Upon termination or expiration of this Contract or a Statement of Work, in whole or in part, each party must, within five (5) Business Days from the date of termination, return to the other party any and all Confidential Information received from the other party, or created or received by a party on behalf of the other party, which are in such party's possession, custody, or control. Upon confirmation from the State, of receipt of all data, Contractor must permanently sanitize or destroy the State's Confidential Information, including State Data, from all media including backups using National Security Agency ("NSA") and/or National Institute of Standards and Technology ("NIST") (NIST Guide for Media Sanitization 800-88) data sanitation methods or as otherwise instructed by the State. If the State determines that the return of any Confidential Information is not feasible or necessary, Contractor must destroy the Confidential Information as specified above. The Contractor must certify the destruction of Confidential Information (including State Data) in writing within five (5) Business Days from the date of confirmation from the State.

23. Records Maintenance, Inspection, Examination, and Audit.

23.1 Right of Audit. Pursuant to MCL 18.1470, the State or its designee may audit Contractor to verify compliance with this Contract. Contractor must retain and provide to the State or its designee and the auditor general upon request, all financial and accounting records related to this Contract through the Term of this Contract and for four (4) years after the latter of termination, expiration, or final payment under this Contract or any extension ("**Financial Audit Period**"). If an audit, litigation, or other action involving the records is initiated before the end of the Financial Audit Period, Contractor must retain the records until all issues are resolved.

23.2 Right of Inspection. Within ten (10) calendar days of providing notice, the State and its authorized representatives or designees have the right to enter and inspect Contractor's premises or any other places where Services are being performed, and examine, copy, and audit all records related to this Contract. Contractor must cooperate and provide reasonable assistance. If financial errors are revealed, the amount in error must be reflected as a credit or debit on subsequent invoices until the amount is paid or refunded. Any remaining balance at the end of this Contract must be paid or refunded within forty-five (45) calendar days.

23.3 Application. This **Section 23** applies to Contractor, any Affiliate, and any Permitted Subcontractor that performs Services in connection with this Contract.

24. Support Services. Contractor will provide the State with the Support Services described in the Service Level Agreement attached as **Schedule D** to this Contract. Such Support Services will be provided:

(a) Free of charge during the Warranty Period.

(b) Thereafter, for so long as the State elects to receive Support Services for the Software, in consideration of the State's payment of Fees for such services in accordance with the rates set forth in the Pricing Schedule.

25. Data Security Requirements. Throughout the Term and at all times in connection with its actual or required performance of the Services, Contractor will maintain and enforce an information security program including safety and physical and technical security policies and procedures with respect to its Processing of the State's Confidential Information that comply with the requirements of the State's data security policies as set forth in **Schedule E** to this Contract.

26. Training. Contractor will provide, at no additional charge, training on all uses of the Software permitted hereunder in accordance with the times, locations and other terms set forth in a Statement of Work. Upon the State's request, Contractor will timely provide training for additional Authorized Users or other additional training on all uses of the Software for which the State requests such training, at such reasonable times and locations and pursuant to such rates and other terms as are set forth in the Pricing Schedule.

27. Maintenance Releases; New Versions

27.1 Maintenance Releases. Provided that the State is current on its Fees, during the Term, Contractor will provide the State, at no additional charge, with all Maintenance Releases, each of which will constitute Software and be subject to the terms and conditions of this Contract.

27.2 New Versions. Provided that the State is current on its Fees, during the Term, Contractor will provide the State, at no additional charge, with all New Versions, each of which will constitute Software and be subject to the terms and conditions of this Contract.

27.3 Installation. The State has no obligation to install or use any Maintenance Release or New Versions. If the State wishes to install any Maintenance Release or New Version, the State will have the right to have such Maintenance Release or New Version installed, in the State's discretion, by Contractor or other authorized party as set forth in a Statement of Work. Contractor will provide the State, at no additional charge, adequate Documentation for installation of the Maintenance Release or New Version, which has been developed and tested by Contractor and Acceptance Tested by the State. The State's decision not to install or implement a Maintenance Release or New Version of the Software will not affect its right to receive Support Services throughout the Term of this Contract.

28. Source Code Escrow

28.1 Escrow Contract. The parties may enter into a separate intellectual property escrow agreement. Such escrow agreement will govern all aspects of Source Code escrow and release. The cost of the escrow will be the sole responsibility of Contractor.

28.2 Deposit. Within thirty (30) business days of the Effective Date, Contractor will deposit with the escrow agent, pursuant to the procedures of the escrow agreement, the Source Code for the Software, as well as the Documentation and names and contact information for each author or other creator of the Software. Promptly after release of any update, upgrade, patch, bug fix, enhancement, new version, or other revision to the Software, Contractor will deposit updated Source Code, documentation, names, and contact information with the escrow agent.

28.3 Verification. At State's request and expense, the escrow agent may at any time verify the Deposit Material, including without limitation by compiling Source Code, comparing it to the Software, and reviewing the completeness and accuracy of any and all material. In the event that the Deposit Material does not conform to the requirements of **Section 28.2** above:

(a) Contractor will promptly deposit conforming Deposit Material; and

(b) Contractor will pay the escrow agent for subsequent verification of the new Deposit Material. Any breach of the provisions of this **Section 28.3** will constitute material breach of this Contract, and no further payments will be due from the State until such breach is cured, in addition to other remedies the State may have.

28.4 Deposit Material License. Contractor hereby grants the State a license to use, reproduce, and create derivative works from the Deposit Material, provided the State may not distribute or sublicense the Deposit Material or make any use of it whatsoever except for such internal use as is necessary to maintain and support the Software. Copies of the Deposit Material created or transferred pursuant to this Contract are licensed, not sold, and the State receives no title to or ownership of any copy or of the Deposit Material itself. The Deposit Material constitutes Confidential Information of Contractor pursuant to **Section 22** (Non-disclosure of Confidential Information) of this Contract (provided no provision of **Section 22.4** calling for return of Confidential Information before termination of this Contract will apply to the Deposit Material).

29. Contractor Representations and Warranties.

29.1 Authority. Contractor represents and warrants to the State that:

(a) It is duly organized, validly existing, and in good standing as a corporation or other entity as represented under this Contract under the laws and regulations of its jurisdiction of incorporation, organization, or chartering;

(b) It has the full right, power, and authority to enter into this Contract, to grant the rights and licenses granted under this Contract, and to perform its contractual obligations;

(c) The execution of this Contract by its Representative has been duly authorized by all necessary organizational action; and

(d) When executed and delivered by Contractor, this Contract will constitute the legal, valid, and binding obligation of Contractor, enforceable against Contractor in accordance with its terms.

(e) Contractor is neither currently engaged in nor will engage in the boycott of a person based in or doing business with a strategic partner as described in 22 USC 8601 to 8606.

29.2 Bid Response. Contractor represents and warrants to the State that:

(a) The prices proposed by Contractor were arrived at independently, without consultation, communication, or agreement with any other Bidder for the purpose of restricting competition; the prices quoted were not knowingly disclosed by Contractor to any other Bidder to the RFP; and no attempt was made by Contractor to induce any other Person to submit or not submit a proposal for the purpose of restricting competition;

(b) All written information furnished to the State by or for Contractor in connection with this Contract, including Contractor's Bid Response, is true, accurate, and complete, and contains no untrue statement of material fact or omits any material fact necessary to make the information not misleading;

(c) Contractor is not in material default or breach of any other contract or agreement that it may have with the State or any of its departments, commissions, boards, or agencies. Contractor further represents and warrants that it has not been a party to any contract with the State or any of its departments that was terminated by the State within the previous five (5) years for the reason that Contractor failed to perform or otherwise breached an obligation of the contract; and

(d) If any of the certifications, representations, or disclosures made in Contractor's Bid Response change after contract award, the Contractor is required to report those changes immediately to the Contract Administrator.

29.3 Software Representations and Warranties. Contractor further represents and warrants to the State that:

(a) it is the legal and beneficial owner of the entire right, title and interest in and to the Software, including all Intellectual Property Rights relating thereto;

(b) it has, and throughout the license term, will retain the unconditional and irrevocable right, power and authority to grant and perform the license hereunder;

(c) it has, and throughout the Term and any additional periods during which Contractor does or is required to perform the Services will have, the unconditional and irrevocable right, power and authority, including all permits and licenses required, to provide the Services and grant and perform all rights and licenses granted or required to be granted by it under this Contract;

(d) the Software, and the State's use thereof, is and throughout the license term will be free and clear of all encumbrances, liens and security interests of any kind;

(e) neither its grant of the license, nor its performance under this Contract does or to its knowledge will at any time:

(i) conflict with or violate any applicable law;

(ii) require the consent, approval or authorization of any governmental or regulatory authority or other third party; or

(iii) require the provision of any payment or other consideration to any third party;

(f) when used by the State or any Authorized User in accordance with this Contract and the Documentation, the Software, the Hosted Services, if applicable, or Documentation as delivered or installed by Contractor does not or will not:

(i) infringe, misappropriate, or otherwise violate any Intellectual Property Right or other right of any third party; or

(ii) fail to comply with any applicable law;

(g) as provided by Contractor, the Software and Services do not and will not at any time during the Term contain any:

(i) Harmful Code; or

(ii) Third party or Open-Source Components that operate in such a way that it is developed or compiled with or linked to any third party or Open-Source Components, other than Approved Third Party Components specifically described in a Statement of Work.

(h) all Documentation is and will be complete and accurate in all material respects when provided to the State such that at no time during the license term will the Software have any material undocumented feature; and

(i) it will perform all Services in a timely, skillful, professional and workmanlike manner in accordance with commercially reasonable industry standards and practices for similar services, using personnel with the requisite skill, experience and qualifications, and will devote adequate resources to meet its obligations under this Contract.

(j) when used in the Operating Environment (or any successor thereto) in accordance with the Documentation, all Software as provided by Contractor, will be fully operable, meet all applicable specifications, and function in all respects, in conformity with this Contract and the Documentation;

(k) Contractor acknowledges that the State cannot indemnify any third parties, including but not limited to any third-party software providers that provide software that will be incorporated in or otherwise used in conjunction with the Services, and that notwithstanding anything to the contrary contained in any third-party software license agreement or end user license agreement, the State will not indemnify any third party software provider for any reason whatsoever;

(l) no Maintenance Release or New Version, when properly installed in accordance with this Contract, will have a material adverse effect on the functionality or operability of the Software.

(m) all Configurations or Customizations made during the Term will be forward-compatible with future Maintenance Releases or New Versions and be fully supported without additional costs.

(n) If Contractor Hosted:

(i) Contractor will not advertise through the Hosted Services (whether with adware, banners, buttons or other forms of online advertising) or link to external web sites that are not approved in writing by the State;

(ii) the Software and Services will in all material respects conform to and perform in accordance with the Specifications and all requirements of this Contract, including the Availability and Availability Requirement provisions set forth in the Service Level Agreement;

(iii) all Specifications are, and will be continually updated and maintained so that they continue to be, current, complete and accurate and so that they do and will continue to fully describe the Hosted Services in all material respects such that at no time during the Term or any additional periods during which Contractor does or is required to perform the Services will the Hosted Services have any material undocumented feature;

(o) During the Term of this Contract, any audit rights contained in any third-party software license agreement or end user license agreement for third-party software incorporated in or otherwise used in conjunction with the Software or with the Hosted Services, if applicable, will apply solely to Contractor or its Permitted Subcontractors. Regardless of anything to the contrary contained in any third-party software license agreement or end user license agreement, third-party software providers will have no audit rights whatsoever against State Systems or networks.

29.4 Disclaimer. EXCEPT FOR THE EXPRESS WARRANTIES SET FORTH IN THIS AGREEMENT, CONTRACTOR HEREBY DISCLAIMS ALL WARRANTIES, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, WITH RESPECT TO THIS CONTRACT.

30. Offers of Employment. During the first twelve (12) months of the Contract, should Contractor hire an employee of the State who has substantially worked on any project covered by this Contract without prior written consent of the State, the Contractor will be billed for fifty percent (50%) of the employee's annual salary in effect at the time of separation.

31. Conflicts and Ethics. Contractor will uphold high ethical standards and is prohibited from: (a) holding or acquiring an interest that would conflict with this Contract; (b) doing anything that creates an appearance of impropriety with respect to the award or performance of the Contract; (c) attempting to influence or appearing to influence any State employee by the direct or indirect offer of anything of value; or (d) paying or agreeing to pay any person, other than employees and consultants working for Contractor, any consideration contingent upon the award of the Contract. Contractor must immediately notify the State of any violation or potential violation of these standards. This Section applies to Contractor, any parent, affiliate, or subsidiary organization of Contractor, and any Permitted Subcontractor that provides Services and Deliverables in connection with this Contract.

32. Compliance with Laws. Contractor, its subcontractors, including Permitted Subcontractors, and their respective Representatives must comply with all laws in connection with this Contract.

33. Nondiscrimination. Under the Elliott-Larsen Civil Rights Act, 1976 PA 453, MCL 37.2101, *et seq*., the Persons with Disabilities Civil Rights Act, 1976 PA 220, MCL 37.1101, *et seq*., and Executive Directive 2019-09, Contractor and its subcontractors agree not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex (as defined in Executive Directive 2019-09), height, weight, marital status, partisan considerations, any mental or physical disability, or genetic information that is unrelated to the person's ability to perform the duties of a particular job or position. Breach of this covenant is a material breach of the Contract.

34. Unfair Labor Practice. Under MCL 423.324, the State may void any Contract with a Contractor or Permitted Subcontractor who appears on the Unfair Labor Practice register compiled under MCL 423.322.

35. Governing Law. This Contract is governed, construed, and enforced in accordance with Michigan law, excluding choice-of-law principles, and all claims relating to or arising out of this Contract are governed by Michigan law, excluding choice-of-law principles. Any dispute arising from this Contract must be resolved in the Michigan Court of Claims. Complaints against the State must be initiated in Ingham County, Michigan. Contractor waives any

objections, such as lack of personal jurisdiction or *forum non conveniens*. Contractor must appoint an agent in Michigan to receive service of process.

36. Non-Exclusivity. Nothing contained in this Contract is intended nor is to be construed as creating any requirements contract with Contractor, nor does it provide Contractor with a right of first refusal for any future work. This Contract does not restrict the State or its agencies from acquiring similar, equal, or like Services from other sources.

37. Force Majeure

37.1 Force Majeure Events. Neither party will be liable or responsible to the other party, or be deemed to have defaulted under or breached the Contract, for any failure or delay in fulfilling or performing any term hereof, when and to the extent such failure or delay is caused by: acts of God, flood, fire or explosion, war, terrorism, invasion, riot or other civil unrest, embargoes or blockades in effect on or after the date of the Contract, national or regional emergency, or any passage of law or governmental order, rule, regulation or direction, or any action taken by a governmental or public authority, including imposing an embargo, export or import restriction, quota or other restriction or prohibition (each of the foregoing, a "**Force Majeure Event**"), in each case provided that: (a) such event is outside the reasonable control of the affected party; (b) the affected party gives prompt written notice to the other party, stating the period of time the occurrence is expected to continue; (c) the affected party uses diligent efforts to end the failure or delay and minimize the effects of such Force Majeure Event.

37.2 State Performance; Termination. In the event of a Force Majeure Event affecting Contractor's performance under the Contract, the State may suspend its performance hereunder until such time as Contractor resumes performance. The State may terminate the Contract by written notice to Contractor if a Force Majeure Event affecting Contractor's performance hereunder continues substantially uninterrupted for a period of five (5) Business Days or more. Unless the State terminates the Contract pursuant to the preceding sentence, any date specifically designated for Contractor's performance under the Contract will automatically be extended for a period up to the duration of the Force Majeure Event.

37.3 Exclusions; Non-suspended Obligations. Notwithstanding the foregoing or any other provisions of the Contract or this Schedule:

(a) in no event will any of the following be considered a Force Majeure Event:

(i) shutdowns, disruptions or malfunctions of Hosted Services or any of Contractor's telecommunication or internet services other than as a result of general and widespread internet or telecommunications failures that are not limited to the Hosted Services; or

(ii) the delay or failure of any Contractor Personnel to perform any obligation of Contractor hereunder unless such delay or failure to perform is itself by reason of a Force Majeure Event.

(b) no Force Majeure Event modifies or excuses Contractor's obligations under **Sections 21** (State Data), **22** (Non-Disclosure of Confidential Information), or **17** (Indemnification) of the Contract, Disaster Recovery and Backup requirements set forth in the Service Level Agreement, Availability Requirement (if Contractor Hosted) defined in the Service Level Agreement, or any data retention or security requirements under the Contract.

38. Dispute Resolution. The parties will endeavor to resolve any Contract dispute in accordance with this provision. The dispute will be referred to the parties' respective Contract Administrators. Such referral must include a description of the issues and all supporting documentation. The parties must submit the dispute to a senior executive if unable to resolve the dispute within 15 business days. The parties will continue performing while a dispute is being resolved, unless the dispute precludes performance. A dispute involving payment does not preclude performance. Litigation to resolve the dispute will not be instituted until after the dispute has been elevated to the parties' senior executive and either concludes that resolution is unlikely or fails to respond within fifteen (15) business days. The parties are not prohibited from instituting formal proceedings: (a) to avoid the expiration of statute of limitations period; (b) to preserve a superior position with respect to creditors; or (c) where a party makes a determination that a

temporary restraining order or other injunctive relief is the only adequate remedy. This Section does not limit the State's right to terminate the Contract.

39. Media Releases. News releases (including promotional literature and commercial advertisements) pertaining to this Contract or project to which it relates must not be made without the prior written approval of the State, and then only in accordance with the explicit written instructions of the State.

40. Severability. If any part of this Contract is held invalid or unenforceable, by any court of competent jurisdiction, that part will be deemed deleted from this Contract and the severed part will be replaced by agreed upon language that achieves the same or similar objectives. The remaining Contract will continue in full force and effect.

41. Waiver. Failure to enforce any provision of this Contract will not constitute a waiver.

42. Survival. The rights, obligations and conditions set forth in this **Section 42** and **Section 1** (Definitions), **Section 16.3** (Transition Responsibilities), **Section 17** (Indemnification), **Section 19** (Disclaimer of Damages and Limitations of Liability), **Section 21** (State Data), **Section 22** (Non-Disclosure of Confidential information), **Section 29** (Contractor Representations and Warranties), **Section 53** (Effect of Contractor Bankruptcy) and **Schedule C** Insurance, and any right, obligation or condition that, by its express terms or nature and context is intended to survive the termination or expiration of this Contract, survives any such termination or expiration.

43. Administrative Fee and Reporting Contractor must pay an administrative fee of 1% on all payments made to Contractor under the Contract for transactions with MiDEAL members, and other states (including governmental subdivisions and authorized entities).

Administrative fee payments must be made online by check or credit card at:
https://www.thepayplace.com/mi/dtmb/adminfee

Contractor must submit an itemized purchasing activity report, which includes at a minimum, the name of the purchasing entity and the total dollar volume in sales. Reports should be mailed to MiDeal@michigan.gov. The administrative fee and purchasing activity report are due within 30 calendar days from the last day of each calendar quarter.

44. Extended Purchasing Program. This contract is extended to MiDEAL members. MiDEAL members include local units of government, school districts, universities, community colleges, and nonprofit hospitals. A current list of MiDEAL members is available at www.michigan.gov/mideal.

Upon written agreement between the State and Contractor, this contract may also be extended to: (a) other states (including governmental subdivisions and authorized entities) and (b) State of Michigan employees.

If extended, Contractor must supply all Contract Activities at the established Contract prices and terms. The State reserves the right to impose an administrative fee and negotiate additional discounts based on any increased volume generated by such extensions.

Contractor must submit invoices to, and receive payment from, extended purchasing program members on a direct and individual basis.

45. Contract Modification. This Contract may not be amended except by signed agreement between the parties (a "**Contract Change Notice**"). Notwithstanding the foregoing, no subsequent Statement of Work or Contract Change Notice executed after the Effective Date will be construed to amend this Contract unless it specifically states its intent to do so and cites the section or sections amended.

46. HIPAA Compliance. The State and Contractor must comply with all obligations under HIPAA and its accompanying regulations, including but not limited to entering into a business associate agreement, if reasonably necessary to keep the State and Contractor in compliance with HIPAA.

47. Accessibility Requirements.

47.1 All Software provided by Contractor under this Contract, including associated content and documentation, must conform to WCAG 2.0 Level AA. Contractor must provide a description of conformance with WCAG 2.0 Level AA specifications by providing a completed PAT for each product provided under the Contract. At a minimum, Contractor must comply with the WCAG 2.0 Level AA conformance claims it made to the State, including the level of conformance provided in any PAT. Throughout the Term of the Contract, Contractor must:

(a) maintain compliance with WCAG 2.0 Level AA and meet or exceed the level of conformance provided in its written materials, including the level of conformance provided in each PAT;

(b) comply with plans and timelines approved by the State to achieve conformance in the event of any deficiencies;

(c) ensure that no Maintenance Release, New Version, update or patch, when properly installed in accordance with this Contract, will have any adverse effect on the conformance of Contractor's Software to WCAG 2.0 Level AA;

(d) promptly respond to and resolve any complaint the State receives regarding accessibility of Contractor's Software;

(e) upon the State's written request, provide evidence of compliance with this Section by delivering to the State Contractor's most current PAT for each product provided under the Contract; and

(f) participate in the State of Michigan Digital Standards Review described below.

47.2 State of Michigan Digital Standards Review. Contractor must assist the State, at no additional cost, with development, completion, and on-going maintenance of an accessibility plan, which requires Contractor, upon request from the State, to submit evidence to the State to validate Contractor's accessibility and compliance with WCAG 2.0 Level AA. Prior to the solution going-live and thereafter on an annual basis, or as otherwise required by the State, re-assessment of accessibility may be required. At no additional cost, Contractor must remediate all issues identified from any assessment of accessibility pursuant to plans and timelines that are approved in writing by the State.

47.3 Warranty. Contractor warrants that all WCAG 2.0 Level AA conformance claims made by Contractor pursuant to this Contract, including all information provided in any PAT Contractor provides to the State, are true and correct. If the State determines such conformance claims provided by the Contractor represent a higher level of conformance than what is actually provided to the State, Contractor will, at its sole cost and expense, promptly remediate its Software to align with Contractor's stated WCAG 2.0 Level AA conformance claims in accordance with plans and timelines that are approved in writing by the State. If Contractor is unable to resolve such issues in a manner acceptable to the State, in addition to all other remedies available to the State, the State may terminate this Contract for cause under **Section 16.1**.

47.4 Contractor must, without limiting Contractor's obligations of indemnification as further described in this Contract, indemnify, defend, and hold harmless the State for any and all claims, including reasonable attorneys' fees, costs, and incidental expenses, which may be suffered by, accrued against, charged to, or recoverable from the State arising out of its failure to comply with the foregoing accessibility standards

47.5 Failure to comply with the requirements in this **Section 47** shall constitute a material breach of this Contract.

48. Further Assurances. Each party will, upon the reasonable request of the other party, execute such documents and perform such acts as may be necessary to give full effect to the terms of this Contract.

49. Relationship of the Parties. The relationship between the parties is that of independent contractors. Nothing contained in this Contract is to be construed as creating any agency, partnership, joint venture or other form of joint enterprise, employment or fiduciary relationship between the parties, and neither party has authority to contract for nor bind the other party in any manner whatsoever.

50. Headings. The headings in this Contract are for reference only and do not affect the interpretation of this Contract.

51. No Third-party Beneficiaries. This Contract is for the sole benefit of the parties and their respective successors and permitted assigns. Nothing herein, express or implied, is intended to or will confer on any other person or entity any legal or equitable right, benefit or remedy of any nature whatsoever under or by reason of this Contract.

52. Equitable Relief. Each party to this Contract acknowledges and agrees that (a) a breach or threatened breach by such party of any of its obligations under this Contract may give rise to irreparable harm to the other party for which monetary damages would not be an adequate remedy and (b) in the event of a breach or a threatened breach by such party of any such obligations, the other party hereto is, in addition to any and all other rights and remedies that may be available to such party at law, at equity or otherwise in respect of such breach, entitled to equitable relief, including a temporary restraining order, an injunction, specific performance and any other relief that may be available from a court of competent jurisdiction, without any requirement to post a bond or other security, and without any requirement to prove actual damages or that monetary damages will not afford an adequate remedy. Each party to this Contract agrees that such party will not oppose or otherwise challenge the appropriateness of equitable relief or the entry by a court of competent jurisdiction of an order granting equitable relief, in either case, consistent with the terms of this Section.

53. Effect of Contractor Bankruptcy. All rights and licenses granted by Contractor under this Contract are and will be deemed to be rights and licenses to "intellectual property," and all Software and Deliverables are and will be deemed to be "embodiments" of "intellectual property," for purposes of, and as such terms are used in and interpreted under, Section 365(n) of the United States Bankruptcy Code (the "**Code**"). If Contractor or its estate becomes subject to any bankruptcy or similar proceeding, the State retains and has the right to fully exercise all rights, licenses, elections, and protections under this Contract, the Code and all other applicable bankruptcy, insolvency, and similar laws with respect to all Software and other Deliverables. Without limiting the generality of the foregoing, Contractor acknowledges and agrees that, if Contractor or its estate will become subject to any bankruptcy or similar proceeding:

(a) all rights and licenses granted to the State under this Contract will continue subject to the terms and conditions of this Contract, and will not be affected, even by Contractor's rejection of this Contract; and

(b) the State will be entitled to a complete duplicate of (or complete access to, as appropriate) all such intellectual property and embodiments of intellectual property comprising or relating to any Software or other Deliverables, and the same, if not already in the State's possession, will be promptly delivered to the State, unless Contractor elects to and does in fact continue to perform all of its obligations under this Contract.

54. Schedules. All Schedules that are referenced herein and attached hereto are hereby incorporated by reference. The following Schedules are attached hereto and incorporated herein:

Schedule A	Statement of Work
Schedule B	Pricing Schedule
Schedule C	Insurance Schedule
Schedule D	Service Level Agreement
Schedule E	Data Security Requirements
Schedule F	Disaster Recovery Plan (if Contractor Hosted)
Schedule G	Transition Plan
Schedule H	Federal Provisions Addendum
Schedule I	Acceptance Testing

55. Counterparts. This Contract may be executed in counterparts, each of which will be deemed an original, but all of which together are deemed to be one and the same agreement and will become effective and binding upon the parties as of the Effective Date at such time as all the signatories hereto have signed a counterpart of this Contract. A signed copy of this Contract delivered by facsimile, e-mail or other means of electronic transmission (to which a signed copy is attached) is deemed to have the same legal effect as delivery of an original signed copy of this Contract.

56. Entire Agreement. These Terms and Conditions, including all Statements of Work and other Schedules and Exhibits (again collectively the "Contract") constitutes the sole and entire agreement of the parties to this Contract with respect to the subject matter contained herein, and supersedes all prior and contemporaneous understandings and agreements, representations and warranties, both written and oral, with respect to such subject matter. In the event of any inconsistency between the statements made in the Terms and Conditions, the Schedules, Exhibits, and a Statement of Work, the following order of precedence governs: (a) first, these Terms and Conditions and (b) second, Schedule E – Data Security Requirements and (c) third, each Statement of Work; and (d) fourth, the remaining Exhibits and Schedules to this Contract. NO TERMS ON CONTRACTOR'S INVOICES, WEBSITE, BROWSE-WRAP, SHRINK-WRAP, CLICK-WRAP, CLICK-THROUGH OR OTHER NON-NEGOTIATED TERMS AND CONDITIONS PROVIDED WITH ANY OF THE SERVICES, OR DOCUMENTATION HEREUNDER, EVEN IF ATTACHED TO STATE'S DELIVERY OR PURCHASE ORDER, WILL CONSTITUTE A PART OR AMENDMENT OF THIS CONTRACT OR IS BINDING ON THE STATE OR ANY AUTHORIZED USER FOR ANY PURPOSE. ALL SUCH OTHER TERMS AND CONDITIONS HAVE NO FORCE AND EFFECT AND ARE DEEMED REJECTED BY THE STATE AND THE AUTHORIZED USER, EVEN IF ACCESS TO OR USE OF SUCH SERVICE OR DOCUMENTATION REQUIRES AFFIRMATIVE ACCEPTANCE OF SUCH TERMS AND CONDITIONS.

SCHEDULE A - STATEMENT OF WORK

1. The following terms have the meanings set forth below. All initial capitalized terms that are not defined in this Schedule shall have the respective meanings given to them in Section 1 of the Contract Terms and Conditions.

Term	Definition
AADT	Average Annual Daily Traffic
AID	Automated Incident Detection
AMD	Asset Management Database
API	Application Programming Interface
ASOS	Automated Service Observing System
ATDM	Active Transportation Demand Management
ATM	Active Traffic Management
ATMS	Advanced Traffic Management System (software)
AVL	Automated Vehicle Locator
AWOS	Automated Weather Observing System
BDWS	Bridge Deck Warning System
BWB	Blue Water Bridge
CAD	Computer Aided Dispatch
CCTV	Closed-Circuit Television (Cameras)
CLEMIS	Courts and Law Enforcement Management Information System
ConOps	Concept of Operations
CAV	Connected and Automated Vehicles
CV	Connected Vehicle
CWDM	Course Wavelength Division Multiplexing
DDP	Dynamic Display Panels
DMS	Dynamic Message Sign
DOM	Day of Month
DOW	Day of Week
DOY	Day of Year

DSRC	Dedicated Short Range Communication
DTMB	Department of Technology, Management, & Budget
DPS	Dynamic Parking Sign
ESS	Environmental Sensor Station
FHWA	Federal Highway Administration
GHIB	Gordie Howe International Bridge
GUI	Graphical User Interface
HA	High Availability
HAR	Highway Advisory Radio
ICM	Integrated Corridor Management
IGMP	Internet Group Management Protocol
IMO	Integrated Mobile Observation
IP	Internet Protocol
IT	Information Technology
ITS	Intelligent Transportation System
JSON	JavaScript Object Notation
LCR	Lane Closure and Restriction
LCS	Lane Control Sign
MDOT	Michigan Department of Transportation
MSP	Michigan State Police
MUTCD	Manual on Uniform Traffic Control Devices
MVDS	Microwave Vehicle Detection System
NIST	National Institute of Standards and Technology
NTCIP	National Transportation Communications for ITS Protocol
NWS	National Weather Service
OHVDS	Over-Height Vehicle Detection System
PCMS	Portable Changeable Message Sign
PLC	Programmable Logic Controllers

PM	Project Manager
PSAP	Public Safety Answering Point
PTZ	Pan Tilt Zoom
QRG	Quick Reference Guide
QWS	Queue Warning System
REST	Representational State Transfer
RFP	Request for Proposal
RITIS	Regional Integrated Transportation Information System
RPO	Recovery Point Objective
RTO	Recovery Time Objective
RSU	Roadside Unit
RWIS	Road Weather Information Systems
SEOC	State of Michigan Emergency Operations Center
SMS	Short Message Service
SNMP	Simple Network Management Protocol
SOM	State of Michigan
SOP	Standard Operating Procedure
SSP	Safety Service Patrol
TCP	Transmission Control Protocol
TDMS	Transportation Demand Management System
TFM	TerraForm Manager
TIM	Traffic Incident Management
TMC	Traffic Management Center
TOC	Transportation Operation Center
TOD	Time of Day
PIMS	Parking Information and Management System
SSP	Safety Service Patrol
TTS	Travel Time Sign

UDP	User Datagram Protocol
VDS	Vehicle Detection System
VOIP	Voice Over Internet Protocol
VSA	Variable Speed Advisory
WWDS	Wrong Way Driving System
WxTINFO	Weather Response Traffic Information System
WYSIWYG	What You See is What You Get
WZ	Work Zone
WZDx	Work Zone Data Exchange

2. BACKGROUND

The State of Michigan (SOM) is interested in deploying a new advanced traffic management system (ATMS) software to integrate MDOT's intelligent transportation system (ITS) devices through a single interface. The new ATMS will provide MDOT's Transportation Operation Centers (TOCs) the ability to operate, monitor, and manage ITS devices to support the real-time management of MDOT's roadways. MDOT's existing ATMS system, iNet Version 11, is a statewide application that integrates with the 3,000+ ITS devices through a single interface accessible from a SOM workstation with over 1,000 response plans. Response plan guidance, examples, and SOPs are provided in the attachments listed below. Detailed response plan information will be provided following award.

Attachment 2 – Advanced Traffic Management System (ATMS) Concept of Operations, dated March 2021
Attachment 3 – MDOT DMS Message Guidelines, dated April 16, 2020
Attachment 4 – Response Plan Examples
Attachment 5 – Flex Route Standard Operating Procedure (SOP)

The goal in deploying the new ATMS is to identify and update the existing system, maintain existing functionality, and accommodate future functionality and system needs. The iNET system is designed to monitor the health of all ITS devices at regular intervals. This helps to quickly diagnose when devices are down for any variety of reasons. In the case where a device becomes unavailable while in an active response plan, then the message on the sign (or input to the device) will come off depending on the configuration on the device. There is available configuration that blanks out signs (or removes input to devices) after a certain period of no communication or no polling. Within iNET, when the response plan is deactivated, the input to the device is removed (including messages to a sign queue). When iNET resumes connection with the device, if the message or input is still on the local device but not on the iNET queue, auto sync removes that message/input.

The MDOT ITS network spans the entire state, with devices and communications equipment deployed across the Lower and Upper Peninsulas. The expansive network consists of four TOCs that utilize numerous device types and communication methods to collect and disseminate real-time traveler information and support incident management. MDOT's existing ATMS is a single statewide application that integrates with ITS devices through a single interface. TOC operators utilize the software for real-time monitoring of MDOT's ITS infrastructure, such as dynamic message signs (DMSs), closed circuit television (CCTV) cameras, and vehicle detection systems (VDSs). The information collected and disseminated is used to support incident management, work zone operations, special events, and weather events. MDOT continues to deploy emerging mobility solutions that support the real-time management of freeway and arterial congestion through state-of-the-art sensing, communications, and data processing technologies. MDOT's ITS Strategic Plan provides additional background and is available at the following links:

- MDOT ITS Strategic Plan
  https://www.michigan.gov/documents/mdot/MDOT_ITS_Strategic_Plan_2018_623751_7.pdf
- MDOT ITS Strategic Plan – Appendix A
  https://www.michigan.gov/documents/mdot/Appendix_A_-_Existing_MDOT_ITS_Program_Functions_623754_7.pdf

Field Devices

The ATMS shall integrate all of the device types and associated manufacturers listed in the table below using the identified codes/standards. The ITS device quantities and manufacturers are approximate as of October 2021 and may change prior to the new ATMS deployment. MDOT continues to expand its ITS system and the ATMS must not limit the number of devices that can be integrated. Proposed system integrations as defined in the Statement of Work and Business Requirements may require additional device types/manufacturers to be integrated.

Field Device Model and Firmware Updates

The State expects field device models and firmware updates to occur throughout the duration of the contract. These updates are not anticipated to impact the device operation, functionality, or communication standards (as identified in the table below). The configuration and testing costs for the accommodation of these updates must be included in the Operations and Maintenance costs in Schedule B – Pricing.

Field Device Manufacturer Additions

The State expects the need to integrate new field device manufacturers for existing device types throughout the duration of the contract. Contractor must accommodate adding up to two new field device manufacturers per year. These additions are anticipated to operate, function, and use communication standards (as identified in the table below) that align with the existing device type. The configuration and testing costs for the accommodation of these additions must be included in the Operations and Maintenance costs in Schedule B – Pricing. New field device manufacturer additions exceeding two per year will be paid for at the optional unit price provided in Schedule B – Pricing.

Current ATMS Devices			
Device/System	Quantity	Manufacturers	Codes/Standards/Systems
Devices (integrated into current ATMS)			
Closed Circuit Television (CCTV) Cameras (ISO and Fixed)	802	o Vicon o Cohu o American Dynamics o Pelco o Axis o FLIR o MOBOTIX o MOOG o STARDOT	o National Transportation Communications for ITS Protocol (NTCIP) 1201, 1205, 1208, 2104, 2202, and 2301 (as it applies to the SNMP) o National Television Systems Committee (NTSC) o Moving Picture Experts Group (MPEG) o IEEE 802.3 o Open Network Video Interface Forum (ONVIF) Streaming Protocols: o Real Time Streaming Protocol (RTSP) o Real Time Transport Protocol (RTP) o H.264 (primary) and MJPEG (secondary) encoded streams o RTP Multicast (network also contains mixed Unicast, typically when accessing a camera from outside of the regional network segment) o Hypertext Transfer Protocol (HTTP) Tunneling
Vehicle Detection System (VDS)	763	o Wavetronix o Image sensing system G4 o Sensys	o Point-to-Point Protocol (PPP) and Point-to-Multi-Point Protocol (PMPP) via Ethernet communications either by a MVDS internal Ethernet port or external terminal server and Ethernet appliances.

Dynamic Message Signs (DMS) – varying display sizes, large and small	290	o Daktronics o Ledstar o Skyline o Adaptive Micro Systems	o National Transportation Communications for ITS Protocol (NTCIP) 1201, 1203, 2101, 2104, 2202 o IEEE 802.3
Portable Changeable Message Signs (PCMS)	15	o Addco o Vermac o SolarTech o Precision Solar o Wanco	
Lane Control Signs (LCS)	93	o Ledstar	
Dynamic Display Panels (DDP), Travel Time Signs (TTS), Dynamic Parking Signs (DPS), Blank Out Signs (BOS), and Trailblazer Signs.	86	o Daktronics o Ledstar o Adaptive Micro Systems o National Sign and Signal o SESA	
Logical Processing Units	13 Servers 15 Data Loggers 87 I/O's 6 Relays 109 Remote Processing Units	o Xytronix (Data Logger) o Control By Web (Data Logger) o Control By Web (I/O) o Dell (Server) o Advantech (Server) o Advantech (I/O) o ENCOM (I/O) o Wavetronix (I/O) o Acromag (I/O) o Vertiv Geist (I/O) o IT Watchdog by Geist (I/O)	o Modbus TCP/UDP o MQ Telemetry Transport (MQTT) o Simple Network Management Protocol (SNMP) o Rest API (RESTful) o Transport Layer Security (TLS)

Contractor has worked closely with the MDOT technical team and Integral Blue to enhance the reliability of data from the microwave vehicle detection system (MVDS). This has resulted in additional tools to better diagnose the potential issues that result in less accurate data. As part of this solution, the troubleshooting ability from the User Interface (UI) will be enhanced to point to the underlying cause quicker, resulting in less data loss. On top of the system abilities, Contractor has worked with the technical team to create a document outlining all configuration needs to ensure the devices are set up correctly from the start.

iNET ATMS is designed to adapt as it grows and expands. The iNET Application server is comprised of a set of standard libraries and Application Programming Interfaces (APIs) that provide high system flexibility and scalability. iNET is architected to keep data access transactions lean, use tuned and optimized queries, keep asynchronous processing threads short, implement effective caching, and so forth. The iNET system has the capability to be further scaled horizontally through clustering and load balancing, as well as vertically by adding more hardware resources such as Central Processing Unit (CPU) and Memory.

Managed Corridors

The ATMS software is responsible for the seamless operation of MDOT's Managed Corridors. Managed Corridors allow MDOT TOCs to proactively manage roadway operations using any combination of ITS devices, near real-time data, software functionality, and active transportation and demand management (ATDM) strategies. The Managed Corridor operations are focused on improving safety, mobility, reliability, environmental factors, incident management, work zones, special events, and other congestion-related challenges.

ATDM is defined by FHWA as the dynamic management, control, and influence of travel demand, traffic demand, and traffic flow of transportation facilities. ATDM is made up of active demand management, active traffic management (ATM), and active parking management strategies. Refer to FHWA's ATDM program website for definitions of each ATDM strategy.

As defined in Schedule A – Table 1 – Business Specifications, the software functionality typically includes advanced business rules and algorithms to recommend and implement automated response plans, while minimizing input from a Traffic Operations Specialist (also referred to as a TOC Operator). While MDOT's Managed Corridors are based on various components of the core ATMS functionality, the ATMS must provide an efficient and seamless user interface to operate these corridors. While functionality may be common across multiple managed corridors, the ATMS must allow Managed Corridor parameters to be configured on a corridor by corridor basis.

MDOT is currently operating or in the planning stages of operating the following types of Managed Corridors, also referred to as "Systems" in the Business Specifications.

Flex Route

MDOT's active traffic management (ATM) corridors, referred to by MDOT as Flex Route systems, are designed to manage recurring and nonrecurring congestion and improve roadway efficiency and safety. In addition to mitigating traditional roadway capacity constraints and high-crash locations, ATM strategies can positively impact incident management, special events, evacuations, weather events and other unique circumstances. MDOT's Flex Routes use a combination of the following ATM strategies: dynamic lane control, dynamic shoulder use (also known as part-time shoulder use or hard shoulder running), variable speed advisories (VSA), queue warning, and ramp metering. Dynamic shoulder use allows for Traffic Operations Specialists to open the shoulder for motorist during certain times of the day and when traffic demand requires it. Flex Routes utilize lane control signs (LCS), located above the travel lane and/or dynamic shoulder lane, to indicate if the lane or shoulder is open to traffic. The deployed ATM strategies provide additional capacity, improve incident response, create speed harmonization, and provide advanced notice to drivers of upcoming conditions.

MDOT is currently operating or in the planning stages of operating the following Flex Routes:

Route	Limits	Status	Anticipated Go-Live
US-23 (Phase 1)	M-14 to M-36 (~9 miles)	Operational	N/A
US-23 (Phase 2)	M-36 to I-96 (~6 miles)	In Design	2024
I-96	Kent Lake Road to I-275 / I-696 / M-5 (~11 miles)	In Construction	2023
US-131	Ann Street to Post Drive (~7 miles)	In Planning	2028

Advanced Transportation and Demand Management

MDOT's ATDM systems are designed to provide dynamic management, control, and influence of travel demand, traffic demand, and traffic flow on transportation facilities. ATDM strategies can positively impact traffic flow and traveler behavior to delay breakdown conditions, improve safety, promote alternate travel modes, balance demand with available capacity, and reduce emissions. MDOT's ATDM corridors use a combination of the following strategies: VSA, queue warning, traveler information, integrated corridor management (ICM), automated incident detection, and advanced traffic signal systems. The advanced traffic signal system is operated outside of the ATMS.

MDOT is currently operating or in the planning stages of operating the following ATDM corridors.

Route	Limits	Status	Anticipated Go-Live
I-94*	I-96 to Conner Ave (~7 miles)	Operational	N/A

*This system is supporting the I-94 Modernization project which is reconstructing I-94 from I-96 to Conner Ave in various phases over the next 10-15 years. The I-94 reconstruction will likely result in changes to the ATDM functionality throughout the I-94 Modernization project.

Weather Based Variable Speed Advisory

MDOT's Weather-Based Variable Speed Advisory systems provide recommended driving speeds and traveler information based on near real-time roadway, traffic, and weather condition data. The purpose of the system is to improve driver expectations and reduce crashes during adverse weather events by providing motorists with advisory speeds, roadway conditions, and event location messaging (i.e., White Out Conditions 2 Miles Ahead). In addition, the system is utilized year-round and provides non-weather-related messaging through DMS.

MDOT is currently operating or in the planning stages of operating the following Weather-Based VSA corridors.

Route	Limits	Status	Anticipated Go-Live
I-94	I-196/US-31 to 9th Street (~38 miles)	In Construction	2022

Integrated Corridor Management (ICM)

MDOT's ICM systems employ advanced transportation technologies and inter-agency coordination to reduce congestion by dynamically shifting traffic to alternate routes based on changing traffic conditions, such as incidents and congestion. Traveler information in the form of roadside dynamic display panels advise travelers of an alternative and/or emergency route while MDOT and local agencies simultaneously deploy coordinated traffic signal timing plans (outside of ATMS) along those corridors.

MDOT is currently operating or in the planning stages of operating the following ICM systems.

Route	Limits	Status	Anticipated Go-Live
I-696	Macomb County	Operational	N/A
I-75	Oakland County	Operational	N/A
I-75	Wayne County	Operational	N/A

The Concept of Operations for MDOT's Managed Corridors are provided in Attachments 6-8. Contractor will be responsible for delivering the various strategies within each system that meet the Schedule A – Table 1 – Business Specifications and adhere to the final operational concepts within the applicable Concept of Operations as denoted by the "X" in the table below.

Managed Corridor Strategies	Attachment 6	Attachment 7	Attachment 8
Dynamic Lane Control/ Dynamic Shoulder Use	X		
Variable Speed Advisory	X	X	X
Queue Warning	X	X	X
Ramp Metering	X		
Flex Route	X		
Active Transportation and Demand Management		X	

- Attachment 6 – I-96 Flex Route Concept of Operations (this reflects the operations of US-23 Flex Route Phase 1 and Phase 2)
- Attachment 7 – I-94 ATDM Pre-Stage MOT Concept of Operations
- Attachment 8 – Southwest VSA Concept of Operations

MDOT continues to evaluate the use of Managed Corridors across the state and the ATMS must be capable of integrating future Managed Corridor without impacting current operations.

Contractor developed the existing software solution for all of the MDOT Managed Corridors, including the national award-winning US-23 Flex Route. Contractor has been integral in the design and functionality of the I-696 Integrated Corridor Management (ICM) corridor, the US-23 ATM Flex Route, the I-94 Active Transportation Demand Management (ATDM), and the I-94 Southwest Variable Speed Advisory (VSA) project.

In all cases, the approach is the same:

1. Engage stakeholder before, during, and after design.
2. Maintain a systems engineering approach throughout the process.
3. In all cases, tie decisions back to the end user who will be utilizing the system to improve their usability.

The current MDOT iNET deployment already supports multiple managed corridors. MDOT's iNET deployment is specifically designed to allow multiple managed corridors. Each of these corridors can operate independently with its own set of rules and parameters. As already proven in Michigan, iNET's modular and flexible architecture allows for each corridor to operate as needed to address local needs. Contractor's design leverages the ability to set corridor-specific parameters, configurations, and response templates that allow each corridor to operate to fit its own needs while leveraging a common code base.

As with the previous Michigan managed corridor deployments, new corridors can be added at any time without having any down time on any of the existing corridors. Each corridor is its own independent instance in the system. While they share common ATM module code base, they operate in their own instance in production. All corridors listed in the tables above designated as in operation, design, and/or construction are considered to be current/existing within the ATMS system:

Other MDOT Systems

The ATMS software will be responsible for the seamless operation of other MDOT systems as defined in in Schedule A – Table 1 – Business Specifications. These systems are typically deployed at spot and/or short segment locations. Similar to Managed Corridors, these systems are operated using a combination of ITS devices, near real-time data, and software functionality. The software functionality typically includes advanced business rules and algorithms to recommend and implement automated response plans, while minimizing input from a Traffic Operations Specialist. The ATMS must provide an efficient and seamless user interface to operate these systems.

MDOT is currently operating or in the planning stages of operating the following types of systems, as further defined in the Business Specifications. The ATMS must not limit the number of systems that can be integrated into the software.

- Border Wait Time System*
- Wrong Way Driving System (WWDS)*
- Parking and Information Management System (PIMS)*
- Curve Warning System*
- Queue Warning System
- Warning Indicators – for activation of warning indicators, such as flashing beacons and LED border signs as part of Over-height Vehicle Detection System (OHVDS), Bridge Deck Warning System (BDWS), and Highway Advisory Radio (HAR).

*Additional background is provided in MDOT's ITS Strategic Plan – Appendix A.
https://www.michigan.gov/documents/mdot/Appendix_A_-_Existing_MDOT_ITS_Program_Functions_623754_7.pdf

Other Functionality

Contractor has the appropriate staff to help MDOT plan, design, deploy, and maintain a Connected and Automated Vehicle (CAV) program. Specific to the request for bids, Contractor is willing to provide the following services for the SOM:

- Connected Vehicle (CV) Roadside Unit (RSU) Field Survey
- CV Federal Communications Commission (FCC) Licensing & Site Registration
- Map File Configuration
- CV RSU Installation Support & Configuration
- CV Application Development
- CAV Application Engineering Services
- CV Systems Integration

- CV Application Testing

Contractor's extensive expertise covers the full range of research on new technologies, supporting the deployment of pilots and software development and integration. The vast number of Contractor's CAV projects provides a repository of experience in the integration of ITS platforms and systems with CAV/smart mobility technologies.

Contractor's asset management system, called TAM, combines Inventory Management, GIS Management, and Work Management to maximize value and availability of related information through a single user-friendly Graphical User Interface (GUI). Contractor also has experience working with Commercial-Off-The-Shelf (COTS) products such as Cartegraph and Issuetrak. Some of the asset management system capabilities are the following:

- Database management
- Multi-level user access
- Multi-search capabilities
- Multiple filters to refine output
- Analytical reports
- Integrated map layers
- Life cycle historical tracking
- Upgraded system platform
- Flexibility in managing assets
- Integrates with Work Order Tracking System module
- Live updates on asset inventory
- Custom templates for asset types and sites

iNET is built extensively from the concept of modules working together, and this includes Automated Incident Detection (AID). The current MDOT system does not utilize the AID module, but the module is already built for other clients. The module has various modes that can be used dependent on the direction taken.

- A direct interface into a third-party API. If MDOT uses a vendor's system, the UI will take the data in as an input to be an event or as a trigger for an auto-response plan, such as a wrong-way vehicle.
- A business rules-based approach to use other data points to give an estimate for incident detection. The main driver is speed data, and if a drop in speed is calculated or a high variance from historical speed for that time of day, the system generates a potential incident event that an operator can then confirm or terminate.
- Video analytics running on existing video feeds. This requires Graphics Processing Unit (GPU)-based hardware, but the monitored streams can trigger a reliable AID alert if the tracked vehicles show a sudden stop or congestion related to the initial incident.

PURPOSE

The Contractor will provide *a State Hosted* Software Solution and applicable Services

3. IT ENVIRONMENT RESPONSIBILITIES

Contractor will provide a State-hosted version of the iNET ATMS system for MDOT. Contractor will work closely with DTMB (IT) staff for deployment of all the required ATMS software application features, releases, and updates to the State-hosted server and fully comply with the requirements of this Contract.

Included in **SCHEDULE E – Data Security Agreement;** the Contractor will be required to meet all State PSP's, public and non-public applicable to this Contract. Contractor has reviewed and understands all Statewide Policies, Standards, and Procedures (PSPs) and takes no exception to the policies applicable to the contracted system.

Included in **SCHEDULE E – Data Security Agreement;** the Contractor will be required to follow, participate, and be responsive during DTMB's Authority to Operate (ATO) process, which is shown in the below diagram. Depending on

the results of 6.0 Risk Assessment this process can take months before ATO is achieved, which is required prior to the integration of any ITS devices. Contractor must accommodate this process in their project schedule.

Contractor maintains organization security programs aligned with ISO 27001, NIST 800-171, and CMMC. iNET, as the Next Gen ATMS, will run as a State-Hosted application. Contractor will maintain compliance with requirements in SCHEDULE E – Data Security Requirements, all State PSPs, public and non-public applicable to this Contract, and to fulfil the responsibilities to follow, participate, and be responsive during DTMB's Authority to Operate (ATO) process.

Contractor's project team will work with contractor's cybersecurity experts to develop, complete, and provide ongoing maintenance of the system security plan (SSP) using the State's automated governance, risk, and compliance (GRC) platform. Contractor's team has extensive experience implementing system security plans using NIST 800-53, Statewide Information Security Plans, and Shared Responsibility Model implementations like the State-Hosted ATMS system. Contractor's team will work with DTMB and the SOM to ensure the contract system security plans meets the Statewide PSP requirements and contract requirements, utilizing a shared responsibility application of the appropriate security controls.

Contractor will submit evidence, upon request from the SOM, to validate the applicable security controls within 2 weeks of the SOM's request. On an annual basis, or as otherwise required by the SOM such as for significant changes, reassessment of the system's controls will be required to receive and maintain ATO. All identified risks from the SSP will be remediated through a Plan of Action and Milestones (POAM) process with remediation time frames and required evidence based on the risk level of the identified risk.

In addition to the implementation and management of the SSP, to ensure compliance with the SCHEDULE E – Data Security Requirements and applicable Statewide PSP, Contractor has identified the following items to highlight Contractor's approach to compliance.

The ATMS and Database Connections will be configured to ensure that State Data is encrypted in transit and at rest using Federal Information Processing Standards (FIPS) validated Advanced Encryption Standard (AES) encryption modules and a key size of 128 bits or higher.

Contractor may not access, and must not permit any access to, State systems, in whole or in part, whether through the Hosted Services or otherwise, without the State's express prior written authorization. Contractor further understands that such authorization may be revoked by the State in writing at any time in its sole discretion. Any access to State systems must be solely in accordance with the Contract and this Schedule, and in no case exceed the scope of the State's authorization pursuant to this Section. All State-authorized connectivity or attempted connectivity to State systems shall be only through the State's security gateways and firewalls and in compliance with the State's security policies set forth in the Contract as the same may be supplemented or amended by the State and provided to the Contractor from time to time.

During the term, Contractor will maintain complete and accurate records of its data protection practices, IT security controls, and security logs relating to State Data including, but not limited to, any backup, disaster recovery or other policies, practices, or procedures relating to the State Data and any other information relevant to its compliance with this contract. Contractor will work with the State to ensure the portions applicable to the proposed ATMS solution comply with these requirements within a shared responsibility model while running on the State-Hosted infrastructure.

Contractor acknowledges, that without limiting any other audit rights of the State, the State has the right to review Contractor's data privacy and information security program prior to the commencement of services and from time to time during the term of this contract. The State, at its own expense, is entitled to perform, or to have performed, an onsite audit of the Contractor's data privacy and information security program. If the State chooses to perform an onsite audit, the Contractor will make all such records, appropriate personnel, and relevant materials available during normal business hours for inspection and audit by the State or an independent data security expert that is reasonably acceptable to the Contractor, provided that the State: (i) gives the Contractor at least 5 business days prior notice of any such audit; (ii) undertakes such audit no more than once per calendar year, except for good cause shown; and

(iii) conducts or causes to be conducted such audit in a manner designed to minimize disruption of the Contractor's normal business operations and that complies with the terms and conditions of all data confidentiality, ownership, privacy, security, and restricted use provisions of the contract. The State may, but is not obligated to, perform such security audits, which shall, at the State's option and request, include penetration and security tests, of any and all Hosted Services and their housing facilities and operating environments.

Contractor maintains an application security program for iNET that includes annual third-party validation using the Open Web Application Security Project (OWASP) Application Security Verification Standard. These scans and assessments will be completed and provided to the State quarterly (dates to be provided by the State) and for each major release; and scans will be completed in a non-production environment with verifiable matching source code and supporting infrastructure configurations or the actual production environment. The application security policies require code scanning, including:

- Utilization of Dynamic Application Security Testing (DAST) which includes interactive application scanning for vulnerabilities, analysis, remediation, and validation and Interactive Application Security Testing (IAST).
- Utilization of Static Application Security Testing including source code scanning, including the analysis, remediation and validation of vulnerabilities identified by application source code scans.
- Utilization of Software Composition Analysis that includes third-party and open source software. In compliance with Schedule-E, scanning of included third-party and open source software will be documented, and the source supplier must be monitored by Contractor for notification of identified vulnerabilities and remediation.

For a State Hosted Software Solution:

Definitions:

Application – Software programs which provide functionality for end user and Contractor services.

Development - Process of creating, testing and maintaining software components.

Component Matrix	Disclose subcontractor name(s), if applicable.
Application	N/A
Development	N/A

Contractor does not intend to use any subcontractors for this Contract.

Contractor will require access to the State data to load into the Development environment for certain types of debugging. There are some kinds of production issues that can be effectively reproduced and debugged in the Development environment only when the actual set of Production data is loaded. Contractor will require State Data in such cases.

4. ADA COMPLIANCE

The State is required to comply with the Americans with Disabilities Act of 1990 (ADA) and has adopted standards and procedures regarding accessibility requirements for websites and software applications. All websites, applications, software, and associated content and documentation provided by the Contractor as part of the Solution must comply with Level AA of the World Wide Web Consortium (W3C) Web Content Accessibility Guidelines (WCAG) 2.0.

Contractor's iNET developers team went through each screen on the UI and validated the fields against each criterion listed in the PAT form. The results were documented and reported in the submitted PAT form. The PAT form for TIBCO Jaspersoft product was also provided. This report was directly downloaded from the TIBCO Jaspersoft website. TIBCO Jaspersoft is used for creating reports in the ATMS.

5. USER TYPE AND CAPACITY

Type of User	Access Type	Number of Users	Number of Concurrent Users
State Employee	Read, Write, Admin	100	40
State Contractors	Read and Write	100	40
Third Party Users	Read and Write	10	3

Contractor Solution must meet the expected number of concurrent Users.

iNET is designed to concurrently handle large volumes of requests. It uses caching and lowers the number of requests to be handled at the backend API. All incoming requests are processed asynchronously without locking up the system and maintaining high request throughput. The software code is optimized for expedited request processing and high system performance. INET ATMS with integration to thousands of devices and with several hundreds of active users, has proven to be a stable and reliable platform for 24/7 traffic operations. The iNET system has the capability to be scaled up horizontally through clustering and load balancing, as well as vertically by adding more hardware resources such as CPU and Memory while keeping the system performance intact. The system can also be scaled down if needed without affecting system performance.

The current iNET ATMS is hosted in the state Virtual environments. There is a separate VM created each for Production, QA and Development environments. Contractor will continue using the State provided VMs.

Below is the hardware specifications for each of the VMs.

Development Application server VM configuration: 1

MEMORY: Preferred: 32 or 64 GB RAM (Minimum: 16 GB)
8 to 12 vCPUs (minimum 6 vCPUs)
HARD DISK SPACE: Preferred: 500GB to 1 TB Hard drive (Minimum 250GB)
Operating System: Windows 2016 or above

Production Application server VM Configuration – 2 instances (Primary and Back up)

MEMORY: Preferred: 64 GB RAM (Minimum: 32 GB)
8 to 12 vCPUs (minimum 8 vCPUs)
HARD DISK SPACE: 2 drives RAID 1 or greater
Preferred: 2 TB Hard drive (Minimum 1 TB)
Operating System: Windows 2016 or above

QA Application server VM configuration - 1

MEMORY: Preferred: 64 GB RAM (Minimum: 32 GB)
8 to 12 vCPUs (minimum 8 vCPUs)
HARD DISK SPACE: 2 drives RAID 1 or greater
Preferred: 2 TB Hard drive (Minimum 1 TB)
Operating System: Windows 2016 or above

Contractor use the existing Oracle database servers that MDOT is hosting. No additional servers are required at this time.

Minimum database server spec that Contractor typically recommends in a VM is the following:

Production database VM: (Qty-2 for Primary and secondary)
Memory: 64 GB RAM (Minimum: 32 GB)
Hard disk space : 4 TB or more (depending on retention requirements)
For QA database VM (qty 1) : Memory – 64 GB RAM (Minimum: 32 GB)
Hard disk space : 4TB (Minimum: 2 TB)
For Dev database VM(qty:1): Memory – 32 GB RAM
Hard disk space : 2 TB(Minimum: 1TB)

The following were the Video servers specifications (or equivalent) provided to MDOT **(QTY 3**):

PowerEdge R740 Server
PowerEdge R740/R740XD Motherboard
No Trusted Platform Module
Chassis with up to 8 x 2.5" SAS/SATA Hard Drives for 2CPU Configuration
PowerEdge R740 Shipping
PowerEdge R740 Shipping Material
PowerEdge R740 CE, CCC, BIS Marking
Intel Xeon Gold 5218R 2.1G, 20C/40T, 10.4GT/s, 27.5 M Cache, Turbo, HT (125W) DDR4-2666
Intel Xeon Gold 5218R 2.1G, 20C/40T, 10.4GT/s, 27.5 M Cache, Turbo, HT (125W) DDR4-2666
Additional Processor Selected
HS Install Kit,GPU Config,No cable
3200MT/s RDIMMs
Performance Optimized
Unconfigured RAID
PERC H740P RAID Controller, LP Adapter
No Operating System
OpenManage Enterprise Advanced
iDRAC9 Datacenter 14G
iDRAC Group Manager, Enabled
iDRAC,Legacy Password
Riser Config 6, 5 x8, 3 x16 slots
QLogic FastLinQ 41164 Quad Port 10GbE 10GBASE-T, rNDC

No Internal Optical Drive
6 Performance Fans forR740/740XD
Dual, Hot-plug, Redundant Power Supply (1+1), 1100W
PowerEdge 2U Standard Bezel
Dell EMC Luggage Tag
Quick Sync 2 (At-the-box mgmt)
Power Saving Dell Active Power Controller
ReadyRails Sliding Rails With Cable Management Arm
No Systems Documentation, No OpenManage DVD Kit
Basic Next Business Day 36 Months
ProSupport and 4Hr Mission Critical Initial, 36 Month(s)
On-Site Installation Declined
16GB RDIMM, 3200MT/s, Dual Rank
8GB RDIMM, 3200MT/s, Single Rank
480GB SSD SATA Mixed Use 6Gbps 512e 2.5in Hot Plug S4610 Drive
No Media Required
Dell Networking, Cable, SFP+ to SFP+, 10GbE, Copper Twinax Direct Attach Cable, 1 Meter
NVIDIA(R) Tesla(TM) T4 16GB Passive, Single Slot, Full Height GPU
Power Cord - C13, 3M, 125V, 15A (North America, Guam, North Marianas, Philippines, Samoa, Vietnam)

6. ACCESS CONTROL AND AUTHENTICATION

The Contractor's solution must integrate with the State's IT Identity and Access Management (IAM) environment as described in the State of Michigan Digital Strategy (https://www.michigan.gov/dtmb/0,5552,7-358-82547_56345_56351_69611-336646--,00.html), which consist of:

6.1 MILogin/Michigan Identity, Credential, and Access Management (MICAM). An enterprise single sign-on and identity management solution based on IBM's Identity and Access Management products including, IBM Security Identity Manager (ISIM), IBM Security Access Manager for Web (ISAM), IBM Tivoli Federated Identity Manager (TFIM), IBM Security Access Manager for Mobile (ISAMM), and IBM DataPower, which enables the State to establish, manage, and authenticate user identities for the State's Information Technology (IT) systems.

6.2 MILogin Identity Federation. Allows federated single sign-on (SSO) for business partners, as well as citizen-based applications.

6.3 MILogin Multi Factor Authentication (MFA, based on system data classification requirements). Required for those applications where data classification is Confidential and Restricted as defined by the 1340.00 Michigan

Information Technology Information Security Policy (i.e. the proposed solution must comply with PHI, PCI, CJIS, IRS, and other standards).

6.4 MILogin Identity Proofing Services (based on system data classification requirements). A system that verifies individual's identities before the State allows access to its IT system. This service is based on "life history" or transaction information aggregated from public and proprietary data sources. A leading credit bureau provides this service.

To integrate with the SOM MILogin solution, the Contractor's solution must support SAML, or OAuth or OpenID interfaces for the SSO purposes.

Contractor will integrate the ATMS application server with MILogin system (Identity Provider Server) using SAML or OAuth or OpenID interface. Software customizations will be required to complete this integration effort. Integration will also involve updating application server configurations, as well as updating iNET login module to use new OpenID Connect method.

iNET successful integration with MILogin will accomplish the following:

a. The MILogin server and the application server can communicate with each other.
b. When a user tries to access iNET ATMS, the user will get redirected to MiLogin page
c. After the user is successfully logged into MILogin, the user will then get redirect back to the iNET ATMS where the user will be able to see the iNET desktop with Maps etc.

Software customizations will be made to handle the user authorization (iNET Roles) mapping after the user is authenticated by MILogin.

7. DATA RETENTION AND REMOVAL

The current data retention schedule for this system is two years of data online and seven years of data offline.

The Contractor will need to retain all data for the entire length of the Contract unless otherwise direct by the State.

The State will need the ability to delete data, even data that may be stored off-line or in backups.

The State will need to retrieve data, even data that may be stored off-line or in backups.

iNET ATMS has been functional at MDOT's facility in compliance with the current data retention and removal policy. If MDOT decides to continue the current retention schedule, ATMS will retain 2 years of data online, and the older data up to 7 years of age can be offloaded to long-term storage. Contractor will continue to assist MDOT/DTMB as needed in restoring archived offline data to the ATMS databases. A separate database schema will be created by Contractor specifically for restoring offline data. This will keep the restored old data in tables separate from the current online Production ATMS data schema. Contractor will provide scripts to retrieve the old data in standard format reports. Contractor will also provide scripts to delete data from the restored tables when required.

8. END USER AND IT OPERATING ENVIRONMENT

The SOM IT environment includes X86 VMware, IBM Power VM, MS Azure/Hyper-V and Oracle VM, with supporting platforms, enterprise storage, monitoring, and management running in house and in cloud hosting provides.

Contractor must accommodate the latest browser versions (including mobile browsers) as well as some pre-existing browsers. To ensure that users with older browsers are still able to access online services, applications must, at a minimum, display and function correctly in standards-compliant browsers and the state standard browser without the use of special plugins or extensions. The rules used to base the minimum browser requirements include:

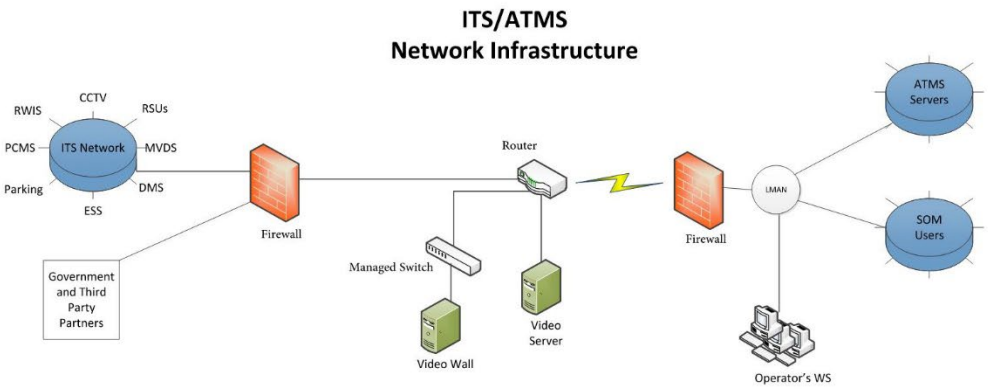
• Over 2% of desktop and mobile & tablet site traffic, measured using Michigan.gov sessions statistics and
• The current browser identified and approved as the State of Michigan standard

This information can be found at https://www.michigan.gov/browserstats. Please use the most recent calendar quarter to determine browser statistics. For those desktop and mobile & tablet browsers with over 2% of site traffic,

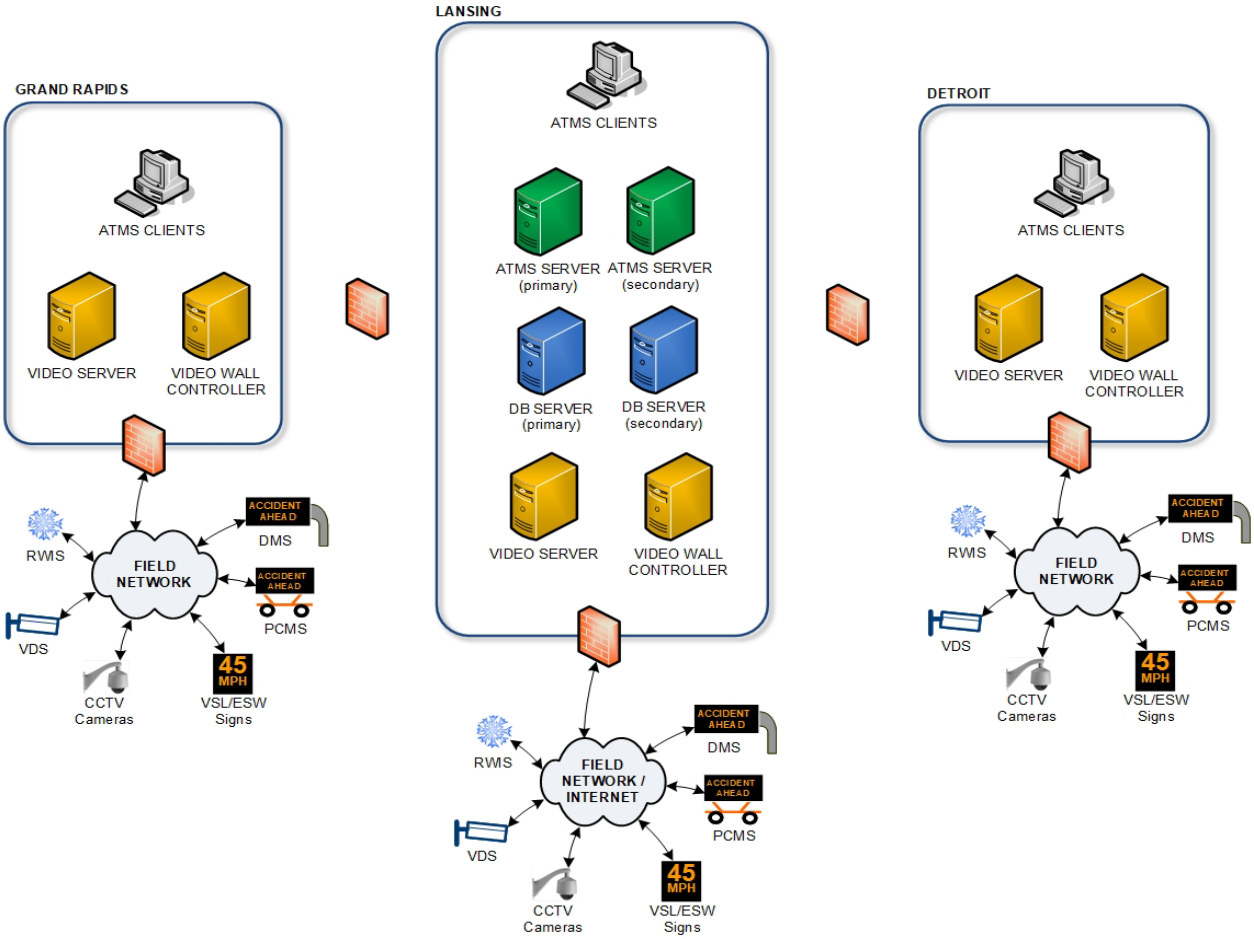
except Internet Explorer which requires support for at minimum version 11, the current browser version as well as the previous two major versions must be supported.

Contractor must support the current and future State standard environment at no additional cost to the State.

The below diagram shows the existing SOM ATMS/ITS network.



System Architecture



Contractor will use the existing MDOT's hosting facility. The overview of high-level system architecture is depicted in Figure above. The Lansing region hosts a pair of redundant ATMS application servers and database servers while a

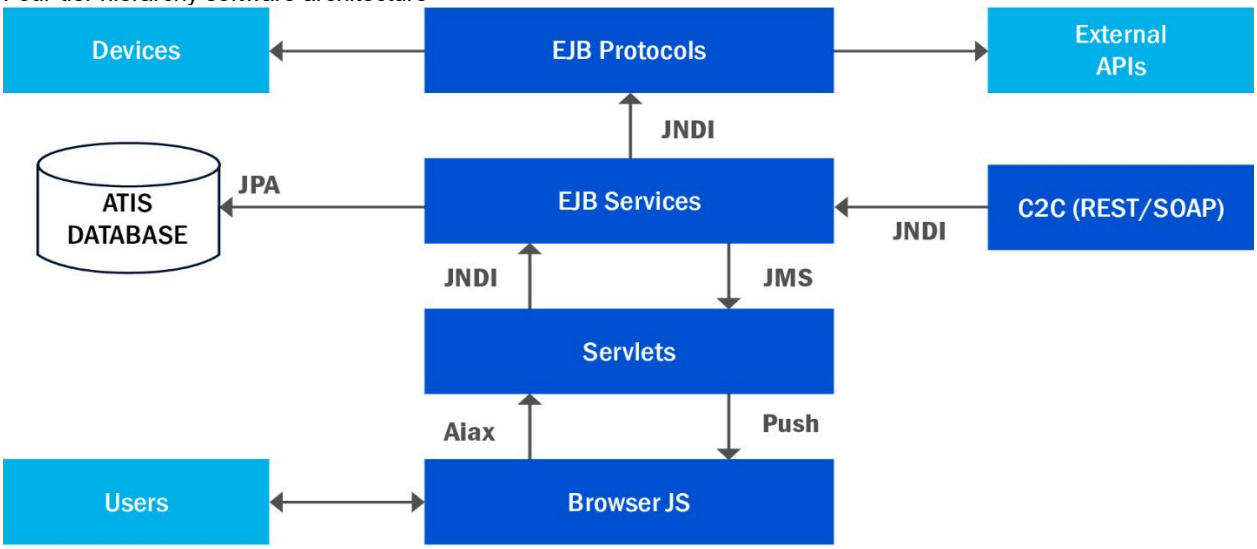
video server is hosted in each of the three regions: Lansing, Detroit, and Grand Rapids. In addition to that, Lansing also hosts application and database servers for QA and Development environments. The QA environment will be configured to mirror the Production environment, thereby allowing testers to validate the iNET software releases and functionality in a "Production like" environment before their actual go-live deployment. The Development environment will be used by developers to test their software changes in the MDOT environment and particularly validate functionality that requires connectivity, such as to field devices and data feed.

iNET ATMS Application Server is a Java Enterprise Edition (EE) hosted application. The application server framework is structured into four distinct software tiers:

- Browser tier
- Servlet tier
- Services tier
- Protocol tier

Each deployment of the ATMS installs "kernel" base components and a customer-specific set of vertical product module components such as Traffic Detection, Video, DMS, and Traffic Signals. Each iNET module provides a set of installable Java EE components that fit into the four-tier hierarchy as shown in Figure 7 below. For example, the DMS module would contain its own software components in browser JavaScript (JS), Servlets, EJB services, and Protocols. There is no dependency on other components across modules, providing a nicely modular and flexible software with no impact to existing functionality in other modules due to addition or enhancements. Installation of INET ATMS might also include some unique set of module components, extensions, and customization.

Four-tier hierarchy software architecture



EJB Protocols are separately installable components that are used for communicating with a particular field device type such as DMS, traffic sensors, and ramp meters. They are also used to serve external APIs. New protocols can easily be added to the suite of existing protocols, including custom specific protocols, without any impact to the existing software.

EJB Services expose callable interfaces implementing largely particular to the domain of a particular product module suite. This layer contains all the business logic and the business rules.

Servlets handle user input to the ATMS. iNET application provides a durable single-page web app using asynchronous (AJAX) calls to interact with the servlets.

Browser JS is the user presentation layer that provides the GUI. This consists of JS-generated widgets.

RDBMS is the Relational Database Management System residing in the Database servers. These are Oracle-based relational tables that store all the ATMS configuration and real-time data.

C2C (Center to Center) provides external API interfaces for use by third parties. There are both SOAP and REST C2C interfaces available.

SOAP interface is for read-only access to the internal system interfaces. This interface conforms to the "Traffic Management Data Dictionary (TMDD) Standard for Traffic Management Center-to-Center Communications" and is often referred to as "the TMDD API."

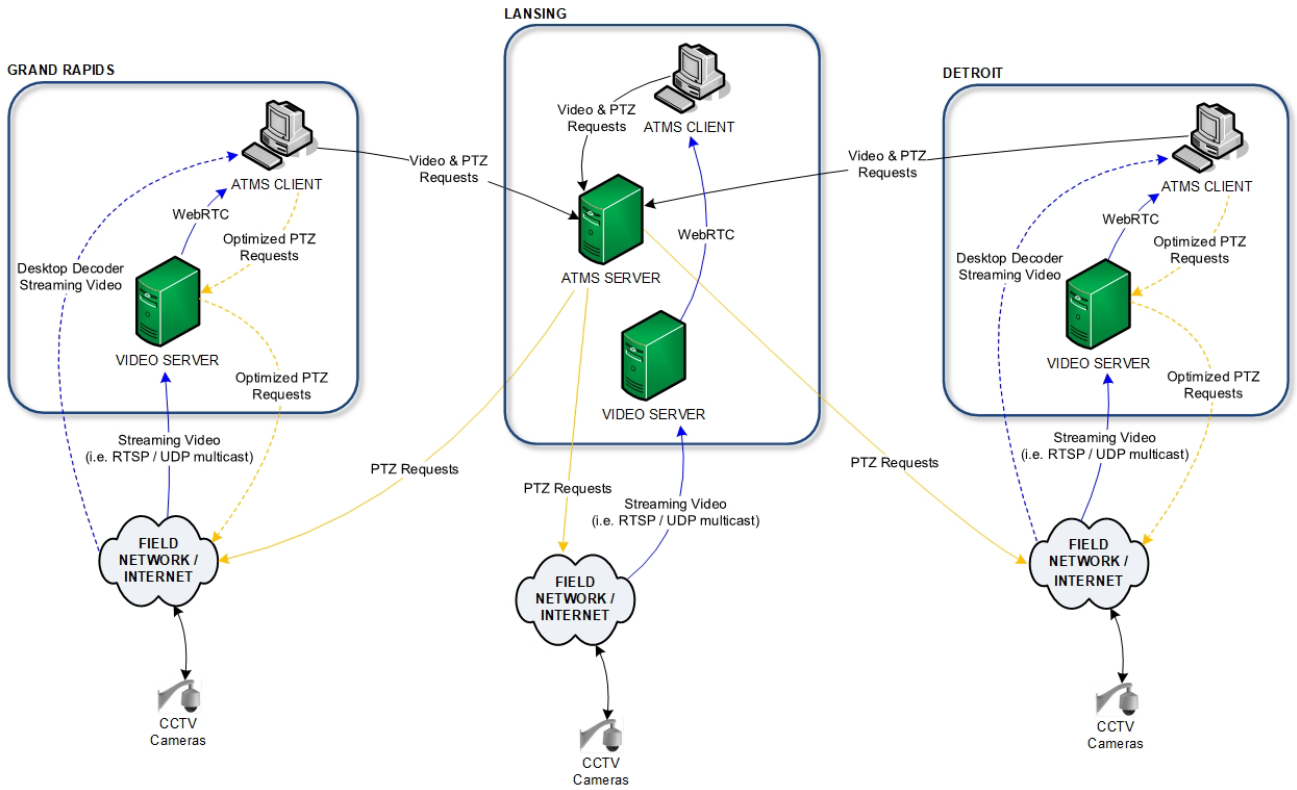
A **REST** interface is an external facing reflection of the Service APIs for use by third parties.

iNET is a component-based architecture, perfectly aligned to offer cost-effective options for interfacing with third-party external systems. Contractor has an extensive library of interfaces and protocols available within iNET supporting several live ATMS implementations. Currently, iNET communicates with several third-party systems through external APIs. A new protocol will be developed within iNET when an external API is provided by an external system to access their data. The protocol layer is fully extensible, allowing ATMS to seamlessly expand its integration with new external systems. Likewise, the C2C layer is extensible, giving us the ability to easily add new interfaces for data sharing with future third-party systems. These interfaces could be standard SOAP or REST or Custom. Custom interfaces are developed when an application or system does not follow an Industry Standard and/or does not have a documented application interface to their product. Typical custom interfaces that iNET Transform has incorporated are CAD, Video Walls, Third-Party Software, and Disparate Legacy System utilizing older technology.

Video Distribution Architecture

The figure below depicts the video distribution solution, including the optimized Pan Tilt Zoom (PTZ) request routing and optional desktop decoder application streaming video. There will be a video server at each of the three regions. Each video server will stream and control the cameras specific to that region.

FIGURE: VIDEO DISTRIBUTION ARCHITECTURE



Minimizing camera control latency is critical for providing the best ATMS user experience. Camera control latency is essentially the time required for the request to transit from the client application to the ATMS server, to be processed by the ATMS server, transmitted over the network, and then processed by the device. Likewise, video latency is the total amount of time required to transmit the video over the network, repackage it (if necessary), and then buffer and decode it within the client application. To minimize the aforesaid latencies, minimizing the number of application-level camera control request "hops" is the best approach. The iNET ATMS video module has been designed to minimize the number of application-level camera control request "hops." No special hardware or network equipment is usually required other than a low-latency IP network connection from the main iNET ATMS server to the field device.

Minimizing camera control latency is critical for providing the best ATMS user experience. Minimizing the number of application-level camera control request "hops" is the best approach. iNET ATMS does not require any special network equipment and only requires a low-latency Internet Protocol (IP) network connection between the main ATMS server and the ATMS end-user clients, field devices, and external APIs.

Minimizing user-perceived closed-circuit television (CCTV) camera latency is important in providing the best ATMS video user experience; total latency below 350 milliseconds (ms) provides the best end-user experience, but total latency is the sum of both camera control latency and video latency 1, 2. Contractor's iNET ATMS has been designed to minimize the total latency by minimizing the camera control latency and the video latency. This is accomplished through the following:

- **Using state-of-the-art video streaming solution:** iNET ATMS uses the latest Wowza streaming engine to stream video from the source to the end-user's browser using the super-low latency WebRTC protocol.

- **Customized video distribution solution:** The placement and number of video streaming servers is customized to MDOT's particular needs and requirements. In practice, this includes performing a network assessment to understand the different classes of networks (e.g., multicast networks, wireless networks, cellular network, wide area network [WAN] interconnections). Based on the results, the video distribution solution is architected to minimize the total video latency. For MDOT, this means a separate video server in Detroit, Grand Rapids, and Lansing.

- **Supporting network level optimizations:** iNET video streaming solution supports network level optimizations, including multicast video distribution. For MDOT, this means a separate video server in Detroit and Grand Rapids to leverage each area's existing multicast field network.

- **Using hardware accelerated video transcoding:** Video distribution (i.e., the process of ingesting either unicast Real-Time Streaming Protocol (RTSP) video or multicast User Datagram Protocol (UDP)/Real-Time Transport Protocol (RTP) video and distributing it as WebRTC) can be an expensive operation for non-H.264/non-H.265 video streams (i.e., for MPEG-4 video streams) where the incoming video must be transcoded before distribution. iNET ATMS leverages hardware accelerated transcoding through the use of multiple Nvidia GPUs to drastically decrease the video transcoding latency. For MDOT, the Detroit and Grand Rapids video server will each have an Nvidia GPU to accelerate any MPEG-4 video sources.

- **Minimizing camera control complexity:** iNET video module minimizes the camera control complexity by requiring no additional third-party hardware or software. The ATMS' camera control protocols support an IP network using either UDP or Transmission Control Protocol (TCP). By minimizing the complexity, no additional network hops or translations are required.
- **Through other software optimizations:** iNET ATMS may also employ other software and camera control optimizations by minimizing the total camera control network transit time. Through a detailed review and examination of the video and camera control latency source, if it is determined that the camera control latency is the primary contributing factor, camera control request routing may be optimized by sending the requests to a local command and control server. This optimization bypasses sending the camera control request back to the main ATMS command and control server (i.e., in Lansing) and instead routes the camera control commands to the most appropriate local video server. For MDOT, the camera control optimization may be employed in both the Detroit and Grand Rapids video servers.

- **Through hybrid video decoding:** When super-low video latency is required, an optional hybrid video decoding solution may be deployed using the Contractor's desktop video decoder application. The desktop video decoder minimizes the video transit time and does not rely on the Wowza video streaming server. It

instead interfaces directly with the video source or the multicast video group. The desktop video decoder also does not require any video transcoding to decode legacy MPEG-4 video sources.

To provide exceptional support, Contractor requests the following access:

- All Contractor's users having VPN access into the State network
- Developers having full access to the Development and QA environment, and full read access to the Production environment
- Access to at least one sample operator workstation to run tests from and observe software behavior in the exact same environment as the end users

Contractor will support the original environment throughout the term of the contract.

All changes to software and architecture are carefully explained and discussed with the stakeholders. The current method has involved biweekly status meetings to track any requests for change and gather consensus if a change is needed. If the change requires specialized collaboration, Contractor schedules a technical group meeting to efficiently focus with the subject matter experts between the State and Contractor. The collaboration can also trigger an operations focused meeting to keep the end-user perspective engaged for the final outcome.

Once a consensus is reached, Contractor will update the group on regular intervals and groups the changes together into defined "Builds." All components of a build are made transparent to the client, and each build includes a test plan to demonstrate the changes that have been made.

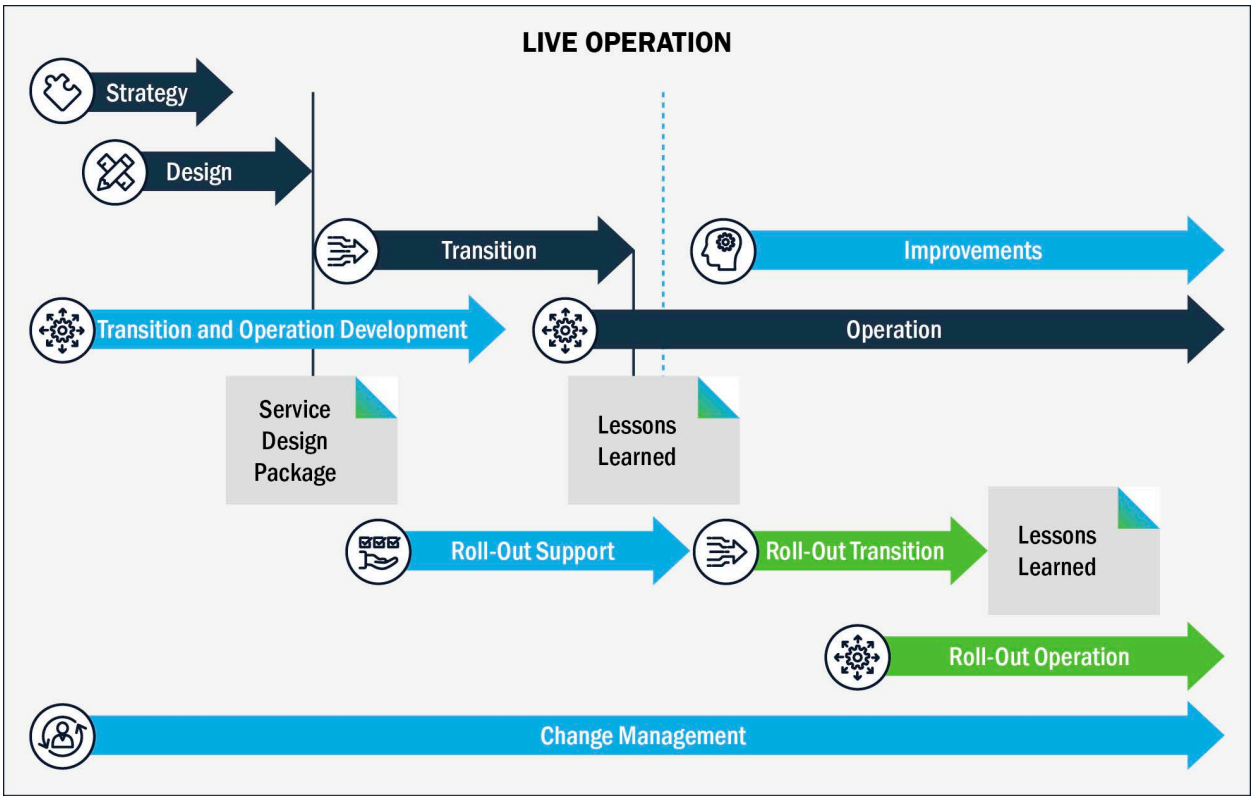
All change requests are tracked in the MDOT Serena system as well as in the internal Contractor's JIRA system. Through discussion with the State, Contractor will categorize all change requests as maintenance, configuration, project-based, or enhancement (upgrade). The simple criteria used is to evaluate if the desired outcome requested was ever part of an existing requirement; the task will be maintenance. If the feature is new and has not been part of any previous requirement, it will be considered an enhancement (upgrade). Change control is then established by assigning tickets to a scheduled build.

These decisions are initially broken down by the Contractor, but the final categorization is a collaborative process between the State and Contractor.

There are no plugins required for the iNET ATMS.

The first step when an enhancement is requested is to meet with the stakeholders closest to the request and walk through the desired outcome, including workflow. Once this is understood, Contractor will define the requirements and put together a small document outlining the understanding of the enhancement along with a level of effort. This is returned to the client to review and, if needed, a follow-up meeting is held to clarify any questions or make edits. Once there is agreement on the design and outcome, the enhancement is assigned to a build. Depending on the magnitude of the enhancement, there will be milestone demonstrations to gather feedback on the final solution.

FIGURE: CHANGE MANAGEMENT PLAN INCORPORATED THROUGHOUT DEPLOYMENT



Contractor's solution is an on-premise ATMS hosted at the State's facility just as it is being hosted presently. However, it should be noted that iNET ATMS is not limited to this option. If the State requires, the ATMS system can also be hosted on the cloud. INET ATMS system is architected to run on-premise and in the cloud environments.

In the existing implementation, Contractor utilizes a custom tool to diagnose VDS details. This tool has been used by Contractor, MDOT, and Integral Blue to diagnose the issues, including communication and configuration outside of only NTCIP-provided data. Outside of this software tool, Contractor works with the team to read Solarwinds outputs and network-level logging as needed.

There are other implementations where the ATMS captures normal SNMP Link/Up and down via SNMP Traps and additional SNMP Diagnostics collected by Nagios/Zabbix or Solar Winds. Ping results and Supervisory Control and Data Acquisition (SCADA) diagnostics are also captured. Proprietary interfaces were developed as well to capture some non NTCIP data.

9. SOFTWARE

Software requirements are identified in **Schedule A – Table 1 Business Specification Worksheet.**

Contractor must provide a list of any third party components, and open source component included with or used in connection with the deliverables defined within this Contract. This information must be provided to the State on a quarterly basis and/or if a new third party or open source component is used in the performance of this Contract.

Look and Feel Standards

All software items provided by the Contractor must adhere to the State of Michigan Application/Site standards which can be found at https://www.michigan.gov/standards.

Mobile Responsiveness
If the software will be used on a mobile device as define in Schedule A – Table 1, Business Specification Worksheet, the Software must utilize responsive design practices to ensure the application is accessible via a mobile device.

SOM IT Environment Access
Contractor must access State environments using one or more of the following methods:

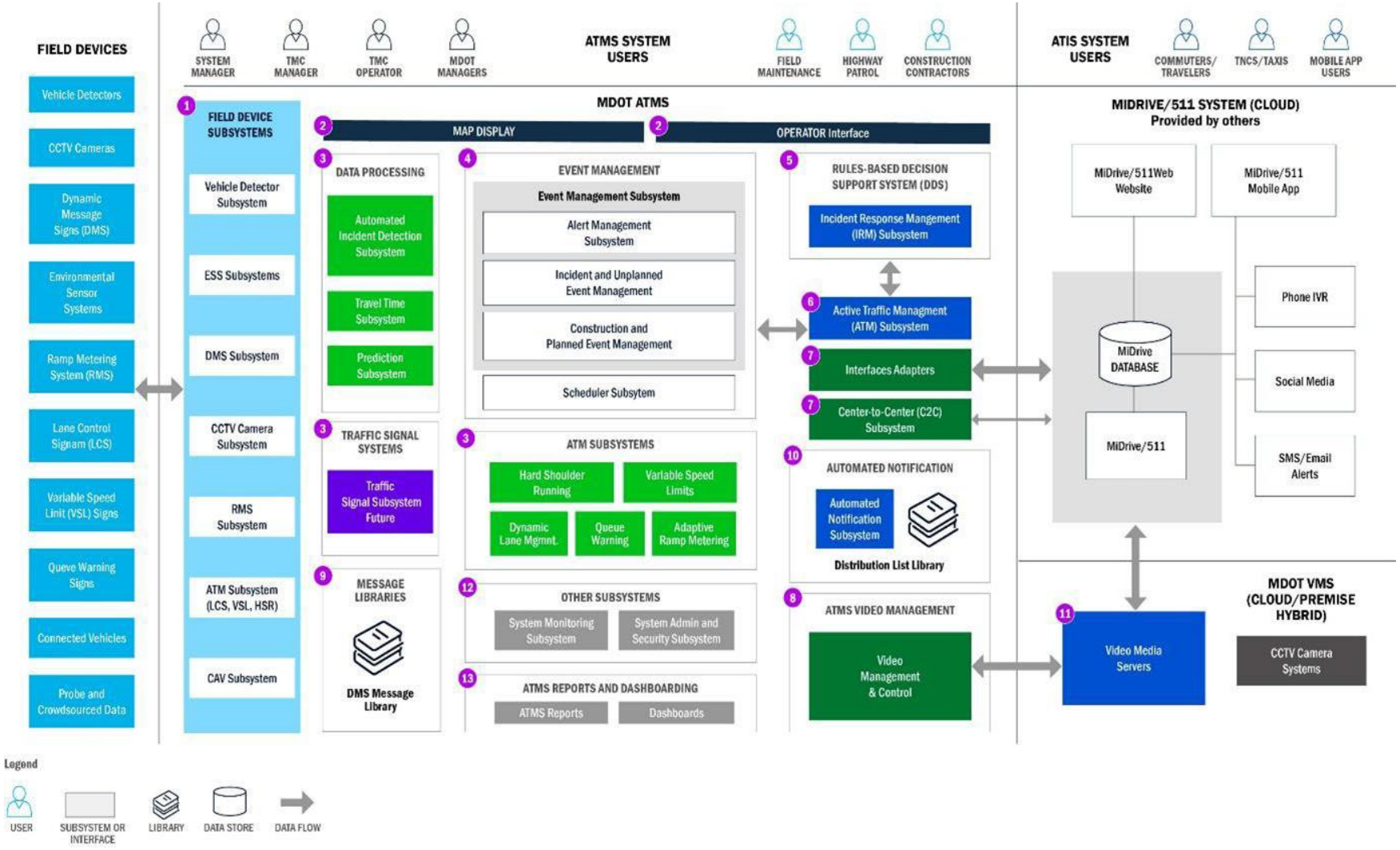
- State provided VDI (Virtual Desktop Infrastructure).
- State provided and managed workstation device.
- Contractor owned and managed workstation maintained to all State policies and standards.
- Contractor required interface with State systems which must be maintained incompliance with State policies and standards as set forth in **Schedule E – Data Security Requirements**.
- From locations within the United States and jurisdiction territories.

Environments
Contractor must provide a development environment, hosted by the Contractor. Contractor must provide environments for SOM training, testing, and production. The testing and production environments must have redundancy with automatic failover for all infrastructure resources (per environment), including database, application server, and other required infrastructure such that if a single server fails, the environment (testing or production) continues to function without human intervention. All ATMS development must be conducted by the Contractor in the Contractor's development environment before being published to the State's testing environment.

- The ATMS testing environment must be available for testing and demonstrating all system functionalities and upgrades prior to being moved to the SOM production environment, without impacting the performance or functionality of the production system.
- The ATMS training environment must be available for training without impacting the performance or functionality of the production system.
- The training and testing environment can be combined into a single environment.
- The ATMS must have a production environment that provides the most recent version of all approved and tested system functionalities.

iNET's modular approach and architecture is best visualized by the following graphics:

INET LOGICAL ARCHITECTURE



#	Item	Description
1	Field Device Subsystems	The iNET ATMS is modular so it includes separate device subsystem interfaces and drivers. There is a separate field device subsystem per device type.
2	Map and User Interface	The system is driven by a GIS map that is user selectable by map type. The US paradigm is common across all modules with one common workspace.
3	Data Processing (including integrations with ATM and Traffic Signal Systems)	These subsystems are used to process and normalize data for other subsystem functions. Typically this would include vehicle detection data. These are the subsystems that handle the ATM controls and algorithms. This includes VSL, dynamic lane management, hard shoulder running, adaptive ramp metering and queue warning.
4	Event Management	This is the module that receives and manages events of all types, including CAD, special events, and incidents.
5	DSS	This is the iNET rules-based DSS, which incorporates basic artificial intelligence (AI) functions and configuration rules to allow users to customize how the system recommends incident responses.
6	ATM	These are the subsystems that handle the ATM controls and algorithms. This includes VSL, dynamic lane management, hard shoulder running, adaptive ramp metering, and queue warning.
7	C2C and External Interfaces	iNET will interface with other systems, including TPIMS and MiDRIVE using external interface modules, primarily Contractor's C2C module. This will occur via C2C communications using direct APIs, C2C protocols, and/or direct device control interfaces.
8	ATMS Video Management	The ATMS takes in video feeds and allows for control, presets, snapshots, and tours.
9	System Libraries	When stored libraries are needed (e.g., for DMS or response plans), they are stored within this single location.
10	Alerts/Notification Subsystem	This system provides notifications via e-mail, text, or phone messages. The iNET solution maintains a database of all contact information and includes criteria for who should be notified, why, and when.
11	ATMS Video Management	As part of the video solution, the architecture leverages three video servers running Wowza and an integration out to a provider.
12	Other Subsystems	This includes the permissions and administration, as well as security.
13	ATMS Data Analytics and Dashboards	The Data Archiving and Reporting module logs and stores all pertinent traffic and event information collected from devices and third-party systems. It is made available for online and ad hoc reporting for any users.

1INET MODULES CURRENTLY AVAILABLE

Base Modules

- Maps
- System Administration & Security (SAS)

Device Modules

- Vehicle Detection System (VDS)
- Dynamic Message Sign (DMS)
- Video/Closed-Circuit Television (CCTV)
- Highway Advisory Radio (HAR)
- Automatic Vehicle Location (AVL)
- Environmental Sensor Station (ESS)
- Ramp Metering System (RMS)
- Internet of Things (IoT)
- Traffic Signal System (TSS)
- Tunnel/SCADA
- Winter Maintenance
- Weigh-in-Motion (WIM)
- Intelligent Parking (IP)
- Safety Service Patrol (SSP)
- Computer-Aided Dispatch (CAD)
- Connected and Autonomous

Intelligence Management Modules

- Active Traffic Management (ATM)
- Automatic Incident Detection (AID)
- Event Management (EM)
- Decision Support System (DSS)/
- Predictive
- Congestion Signing/Travel Times
- Data Analytics Platform (DAP)
- Video Analytics (VA)
- Big Data/Cloud

External Modules

- Advanced Traveler Information System (ATIS)
- Work Zone Traffic Management
- Toll System
- Mobile
- Center-to-Center (C2C)
- Integrated Data Environment
- Edge Computing

- iNET™ modules part of the requirement
- iNET™ modules already present
- iNET™ modules future recommended

INTERNET OF THINGS AND DEVICE CONTROL MODULES

7 The Vehicle Detection System (VDS)/Congestion Monitoring module integrates with a wide variety of vehicle detection technologies, including various vehicle detection sensor types and probe-based data feeds. This module allows users to view real-time roadway traffic conditions by analyzing traffic speeds, volumes, occupancy, and vehicle classification information.

8 The DMS module communicates with fixed and portable DMS signs of varying sizes to disseminate information to motorists. Contractor has a large library of DMS device protocols, including NTCIP v1, NTCIPv2, and other proprietary protocols.

9 The Video/CCTV module offers an end-to-end solution for viewing, controlling, and maintaining the cameras in the system. Standard features include camera control, camera presets, camera tours, video recording, camera locking, user priority override, and video wall control.

10 The Highway Advisory Radio (HAR) module communicates with HAR transmitters and beacons to disseminate real-time traffic information to motorists via standard radio signals. This module composes the radio message, sends the messages to the HAR transmitters, and activates the associated HAR beacons.

11 The Automatic Vehicle Location (AVL) module interfaces with off-the-shelf AVL systems to display real-time information on the locations of vehicles and other moveable assets on the map. This module tracks the location of vehicles such as safety service patrol trucks, buses, trains, snowplows, and other AVL-equipped vehicles and enables the quickest dispatch of emergency responders.

12 The Environmental Sensor System (ESS) module enables users to observe real-time weather conditions, such as surface conditions, temperatures, wind speed, and wind direction, from roadside ESS stations and others weather services feeds such as the National Weather Service (NWS). Color-coded icons on the map quickly alert the user to potentially hazardous weather conditions.

13 The Ramp Metering Systems (RMS) module provides agencies the ability to monitor and control ramp metering systems. The RMS modules enable control via manual local mainline responsive and adaptive means. Adaptive algorithms include fuzzy logic, System-Wide Adaptive Ramp Metering (SWARM) and Corridor Adaptive Ramp Metering Algorithm (CARMA).

14 The Traffic Signal Systems (TSS) module is a full traffic signal monitoring and control system, which includes adaptive traffic signal control functionality. The system includes real-time analytics, arterial traffic signal performance measures (ATSPM), and integration with the other system modules, including ramp metering and DSS.

15 The CAV module enables iNET to receive safety and mobility CAV messages (e.g., BSM1 and BSM2), as well as to send messages to aftermarket devices or directly to vehicle dashboards in support of CV DMAs, such as SPD-HARM and Q-WARN.

16 The Internet of Things (IoT) module allows communication with IoT-connected devices and third-party IoT engines. This module interfaces with IoT devices, such as smart lighting sensors, air quality monitoring sensors, Wi-Fi repeaters, and gunshot detectors, among numerous others.

17 The Tunnel/SCADA module monitors and controls typical traffic management elements, such as vehicle sensors, surveillance cameras, signs, and signals, to manage tunnel traffic. It also interfaces with SCADA elements, such as lighting systems, fire detection, fire suppression, flood controls, carbon monoxide emissions sensors, and fan controls.

18 The Winter Maintenance module is used to monitor and control snowplow maintenance operations in the field. The module receives information from the operator, spreader controller, global positioning system (GPS) receiver, and plow blade sensors. This information is made available via an integrated cellular data modem to the iNET software.

19 The Safety Service Patrol (SSP) module allows for the management of all aspects of the SSP program, including live GPS tracking, routing, dispatch, assignment, shift details, incident details, and reports. When combined with the iNET Event module, the ATMS becomes a single point of management for traffic and safety patrol operations.

20 The Weigh-in-Motion (WIM) module collects data from the WIM devices, which are designed to capture and record truck-axle weights and gross vehicle weights as trucks drive over vehicle sensors.

21 The Intelligent Parking (IP) module assists motorists in finding available parking. IP can operate using a variety of data sources, such as integration with an existing system, in/out counter system, and individual bay monitoring, using hardwired or wireless sensors.

DATA ANALYTICS, DECISION SUPPORT, AND ARTIFICIAL INTELLIGENCE

22 The ATM module manages and controls traffic demand to efficiently use the available capacity of transportation facilities. This module employs various ATM strategies, including VSLs, dynamic lane management, dynamic shoulder use, queue-end warning, reversible lanes, and junction control.

23 The AID module automatically detects congestion and events due to incidents on roadways and alerts the user by placing an unconfirmed icon on the map using its GIS location. This module employs various AID methods, including analytic algorithms, video analytics, and machine learning-based event detection.

24 The Event Management module provides an intuitive interface that allows users to create, monitor, manage, and remove scheduled and unscheduled events. A vast set of transportation event attributes are supported, such as lane blockage patterns, severe injuries, and property damage. Alerts to the user can be configured.

25 The DSS/Response Plans module allows users to quickly respond to events by providing recommendations for how to: (1) Use ITS devices (e.g. DMS, CCTV, ramp meters, traffic signals; (2) provide automatic electronic notifications; (3) dispatch emergency vehicles; and (4) communicate with key management and adjacent agencies.

26 The Congestion Signing/Travel Times module provides travel time information to the public by posting messages on DMSs and websites. Key features include machine learning travel time prediction, customizable target destinations, multi-route destinations, scheduling of operations, and 20 formatting choices.

27 The Predictive module facilitates the integration of online traffic-simulation tools to provide predictive decision support capabilities, and it enables the display and use of 15-, 30-, 45-, and 60-minute prediction data in the forms of level of service, speed, and volume/capacity ratios.

28 The Data Archiving and Reporting module logs and stores all pertinent traffic and event information. The data can be retrieved and viewed in a report and can also be exported to other file formats. This module is used for tracking and reporting key performance indicators (KPIs), such as freeway delay and event response KPIs.

29 The Video Analytics (VA) module uses Contractor-developed embedded VA tools to perform the following types of detection: vehicle presence, vehicle speed, stopped vehicles, and wrong-way driving. The system uses video from any CCTV camera in the system to automatically perform VA without the use of third-party tools or cameras.

EXTERNAL SYSTEM MODULES

30 The C2C module is the gateway through which to send and receive data to and from the iNET and those systems that are external to it, such as other agencies and municipalities. This module is also used, as applicable, to exchange information between adjacent regions. This module manages interaction with legacy systems, partners, and agencies.

31 The Work Zone Traffic Management module enhances agencies' transportation management capabilities within work zones by managing construction-zone ITS technologies and implementing work-zone management strategies. Key features include VSL controls, construction zone speed, event monitoring, and GPS tracking of portable ITS field devices.

32 The Mobile module is a wireless application that allows TMC staff to view and control specific iNET functions, such as CCTV control, DMS control, event entry, and more from tablets and smartphones. It also allows regional travelers to view traffic conditions on their smart phones and wireless-enabled tablets.

33 The Advanced Traveler Information System (ATIS) module is the key public dissemination component of the iNET ATMS suite, allowing users to view real-time roadway traffic conditions via a web page and mobile devices.

34 The Toll System module extends the traffic management capabilities on toll roads to include the capability to integrate with third-party tolling system solutions using two-way communications. This includes assistance with the calculation of tolling rates, camera monitoring and control, and the use of toll DMSs.

35 The Integrated Data Environment module allows for the storage and standardized exchange of all information contained within this environment in real time. All smart-city data are housed within the environment and exchanged in real time using standard C2C interfaces.

36 The Edge Computing module moves specific computing functionality to edge devices; communicates with specific edge devices, such as edge-enabled computer and controllers; and includes capabilities for adaptive traffic signal control functions at the edge of the network.

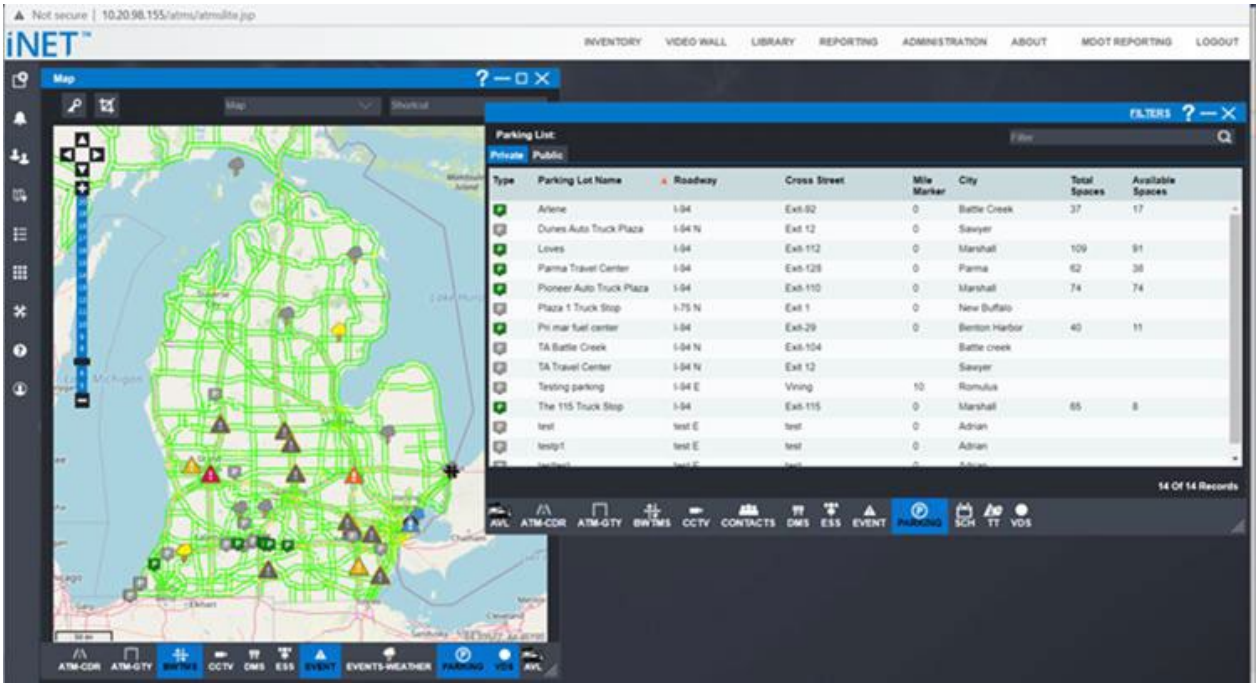
iNET features a browser-based thin client capable of seamlessly integrating a wide variety of ITS applications within a common user environment for the monitoring and management of ITS operations. The iNET user interface can be accessed using current web browsers (including “Chrome version 59 or newer, Firefox version 50 or newer, and Microsoft Edge version 40 or newer). Authorized access to the system can easily be extended throughout the region’s network as needed to authorized users from the field, from home, or from within multiple agencies.

System Description:

iNET MDOT ATMS Desktop

The iNET MDOT ATMS desktop launches in a second (pop-up) browser window, with several ATMS windows already open for the operator. If the operator has saved a particular desktop layout, that layout will be loaded. Otherwise, the default window layout will be loaded. The system allows for multiple map windows to be open concurrently showing different views.

FIGURE: MAP VIEW



The desktop container includes the following items:

- Browser frame, which contains the URL of the ATMS application, along with standard browser controls
- Navigation menu of window types, depicted by icons on a black panel, located on the left
- MDOT logo on the top left corner
- Horizontal menu bar, which also makes available different layers
- Logout link on the top right corner

To create new views, click on the window type in the horizontal menu bar or from the navigation menu. If an operator has the correct permissions to create that type of window, a new window will launch in the desktop container.

Navigation Menu

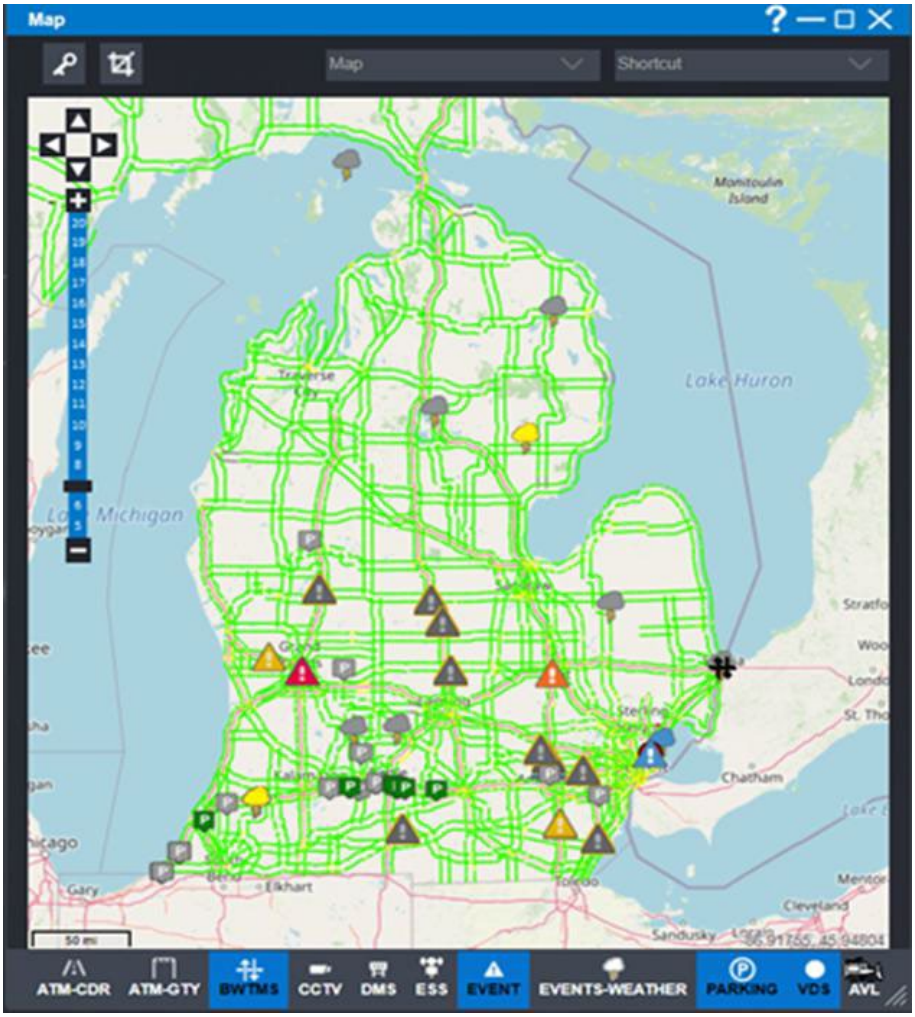
The navigation menu is located along the left wall of the desktop. It contains icons for various window views and allows for quick access to many of the application features.

Navigation Menu Features

Map Window

The Map window provides a real-time graphical representation of all the available and currently selected traffic data for the chosen geographical area as shown in figure below. The GUI overlays real-time traffic status icons on the base map image, giving quick visual access to selected information such as equipment location, event locations, and other data.

FIGURE: MAP WINDOW

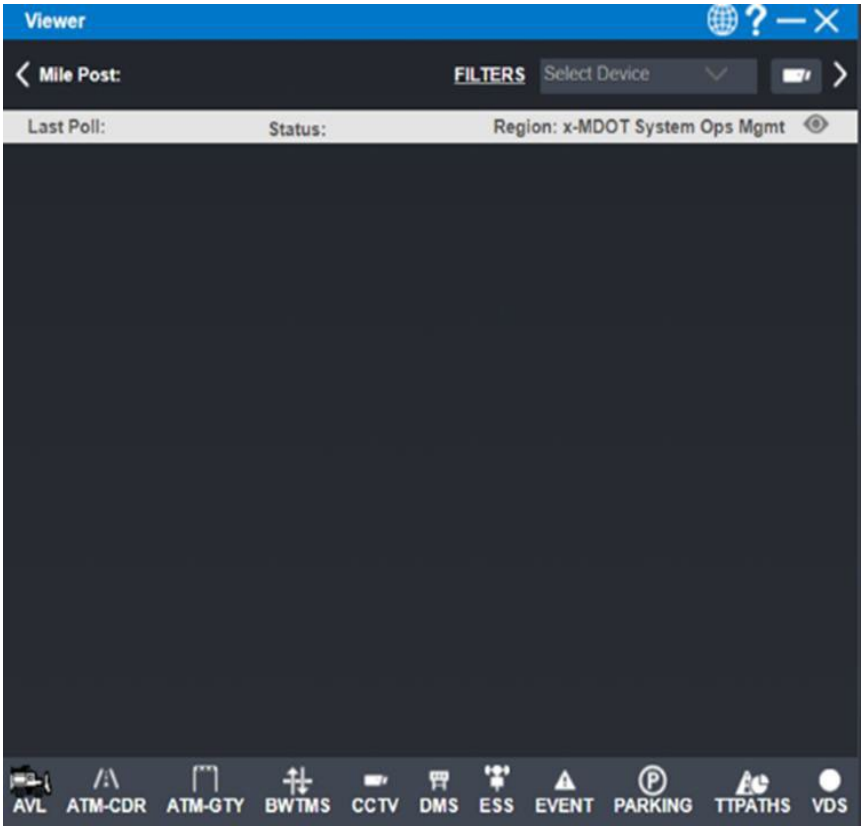


The Map display allows click and drag-and-drop access to equipment control and configuration, and to event information. It includes zoom and map movement capabilities, via the mouse and the zoom bar. This allows access to both a detailed and high-level view of the geographical area.

Viewer Windows

The Viewer windows are the control windows of the ATMS, providing real-time status for and control of the hardware owned by the traffic agency as shown in Figure 15. All equipment listed in the database can be accessed or controlled by permitted users using a Viewer window.

FIGURE: VIEWER WINDOW



Blank Viewer windows can be opened by clicking on the *Viewer* icon in the navigation menu. A Viewer window contains a switcher bar with the viewer types for the ATMS installation. Clicking on a particular type in the switcher bar will open a blank Viewer for that type of equipment or event.

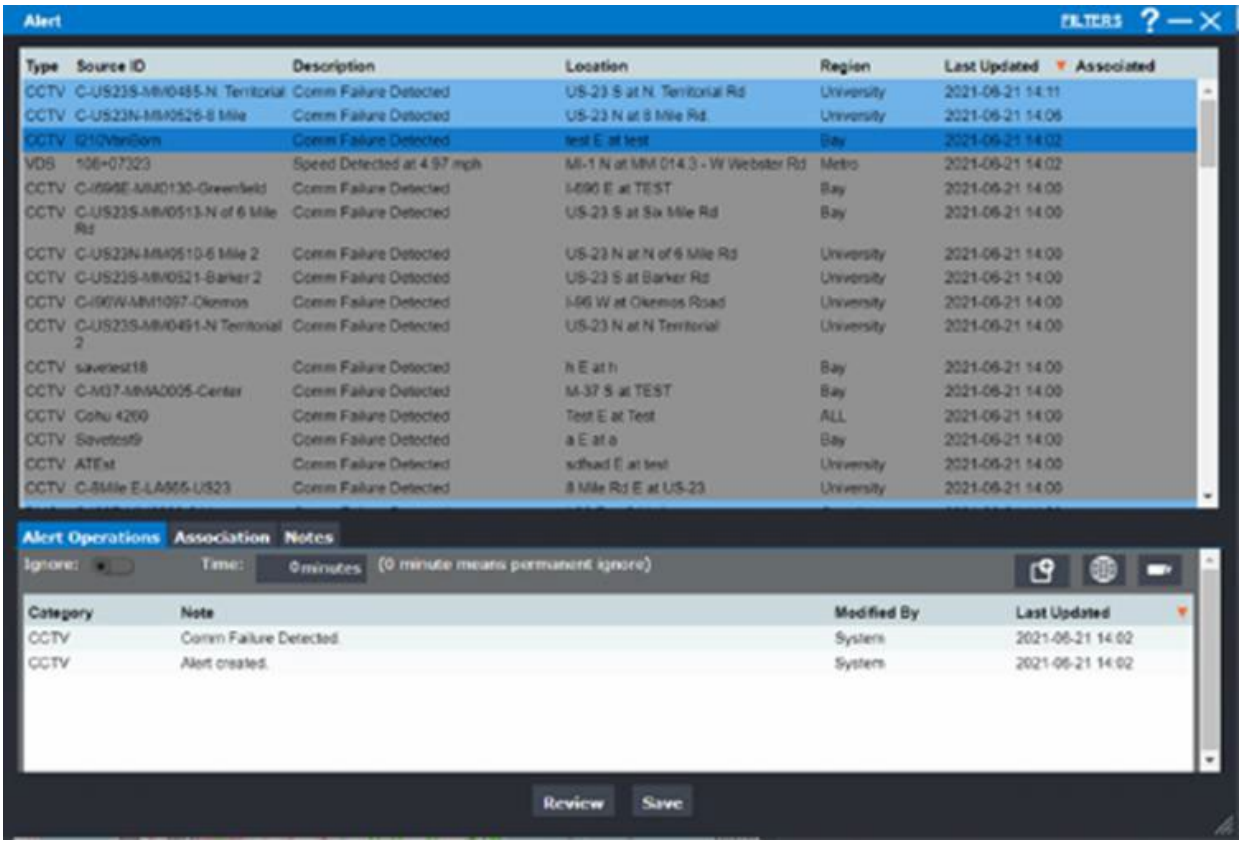
Dragging an icon from the Map window or a List window and dropping the icon onto any Viewer window will open the window for that piece of equipment or event. If that piece of equipment or an event is already open in another viewer window, the original viewer will be brought forward rather than opening in a second viewer window.

Viewer windows can switch between different types of equipment and events using drag and drop. For example, a camera icon can be dropped onto a Viewer window currently open for a DMS, and the viewer will switch to the window for that camera.

Alert Operation Window

The Alert window allows users to view the health of the system. The Alert window reports any device failures, severe weather conditions, as well as severe traffic conditions or events received from external systems.

FIGURE: ALERT WINDOW



Instant Message Window

To quickly communicate with other users currently logged into the ATMS, the Instant Message window can be used.

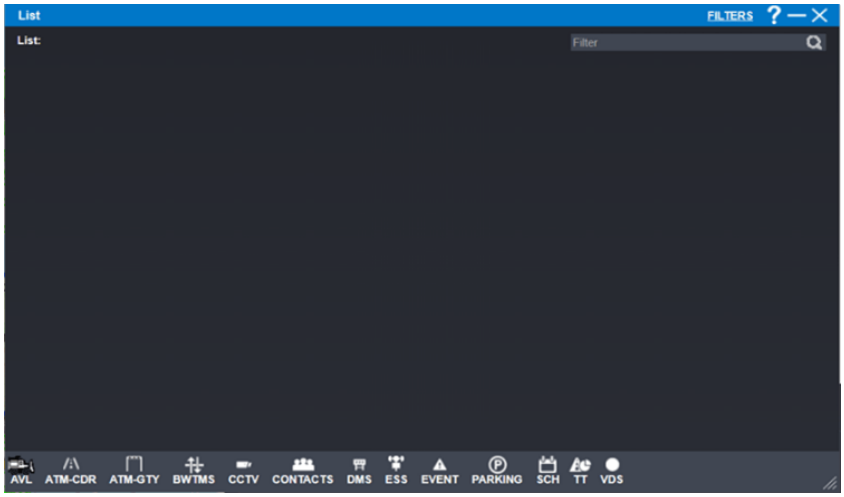
List Window

The List window provides access to lists of devices owned by the organization, lists of events that are occurring in the system, or a list of contacts maintained by the organization. The current travel times can also be viewed.

The default list window is a blank window (figure below) with a switcher bar at the bottom that displays the types of lists that can be generated. To bring up a List window, click the *Launch List* icon on the navigation pane on the left.

FIGURE: LIST WINDOW

Multi-Viewer Window

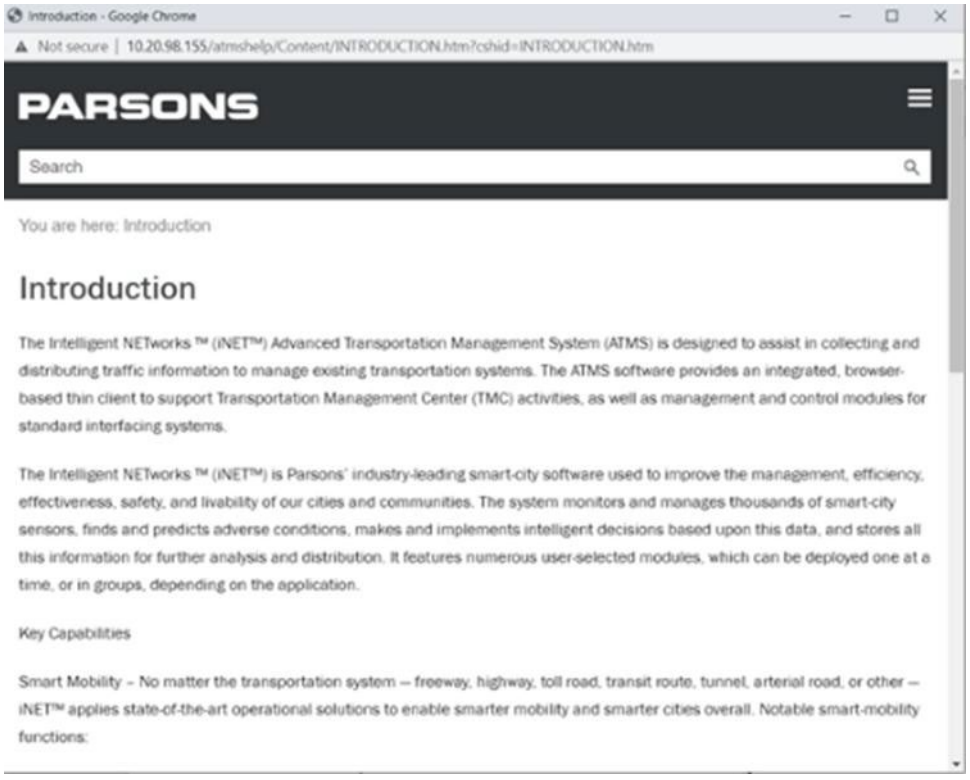


The Multi-Viewer window allows the operator to group devices of different types, and/or events, together into one manageable unit.

For example, an operator can place event information, the CCTV nearest the event, and the DMS nearest the event onto one Multi-Viewer window so that all the pertinent information can be viewed simultaneously. This grouping of information can be named and saved for later recall.

Help Window

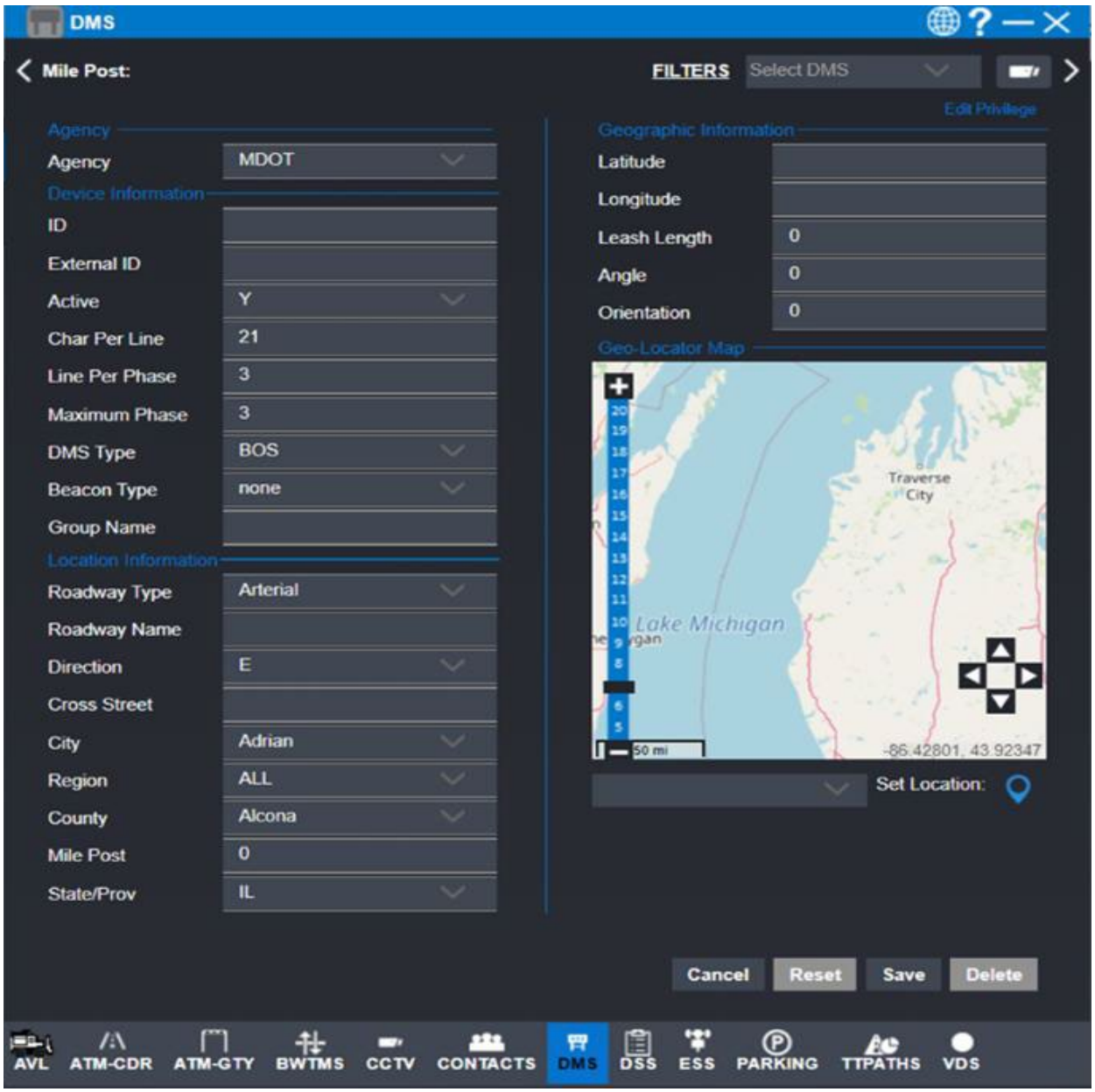
The iNET online help is available by clicking on the icon from the Navigation Menu. The online help will open a separate window enabling the user to view the help files and the ATMS simultaneously. The links available in the help window correspond to the different features available within the ATMS. To access the Help window for an individual feature, click on the link for the desired feature. In addition, most windows within the ATMS have a help topic related to that window. Online help window (figure below)



Inventory Window

The Inventory window (figure below) allows the operator to view detailed information about each of the devices in the system.

FIGURE: INVENTORY WINDOW



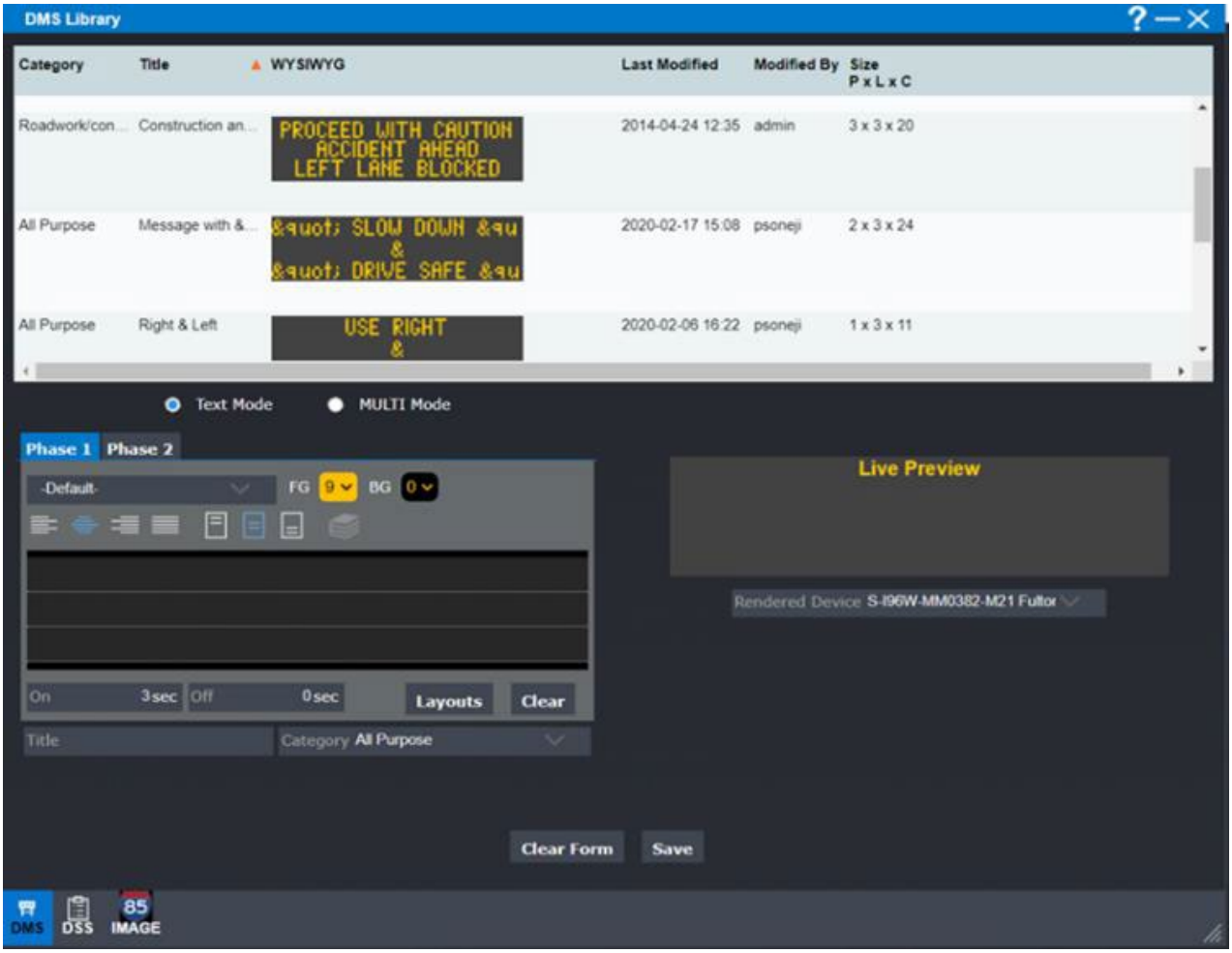
Library Window

The Library window (figure below) is comprised of the following types:

- The DMS library window allows the user to configure predetermined messages for posting on signs. The library stores these often-used messages for later recall.
- The DSS library window allows the user to configure predetermined response plans for managing planned events. By storing the response plans in a library, the user does not need to retype the plan each time.

- The Image library window allows the user to select a predetermined image to be included with the message.

FIGURE: DMS LIBRARY



Reporting Window

The DMS Reporting Window allows the operator access to the various reports that are available within the system, including ATM Corridor, ATM Gantry, CCTV, DMS, ESS, Event, Users, and VDS.

Administration Window

The Administration window allows the user to enter new user accounts, modify user permissions, as well as modify the system configuration settings.

Only those features that the user has permission for are available to the user. For further information on using the features of the Administration window, please see the ATMS System Administration Manual.

Navigating INTELLIGENT NETWORKS® (iNET)

The iNET ATMS is a browser-based, desktop-like environment. Multiple windows allow the operator to work with various system components at the same time. These windows can be moved, resized, and organized by the user to control workflow and information access.

Using the ATMS Windows

The ATMS windows come with standard controls throughout the application. The following tasks can be accomplished using the standard controls:

- **Opening windows**: Windows can be opened by clicking on the desired window type in the horizontal menu bar or from clicking the icon on the navigation bar. Each window comes with a standard header shown below. While most window types have a maximum active number of 2, the Viewer window has a maximum of 8 windows that can be opened simultaneously. This number is configurable by the System Administrator and is described in the System Administration Manual.
- **Closing windows**: Windows can be closed by clicking on the (Close) button located in the toolbar at the upper right corner of that window.
- **Minimizing windows**: Windows can be minimized by clicking on the (Minimize) button in the toolbar. Minimizing a window retains its current contents and places it in the bottom left corner of the ATMS browser window.
- **Maximizing windows:** A minimized window can be maximized by clicking on the header of the minimized window. When maximized, the window retains its current contents.
- **Moving windows**: Window can be moved by holding the left mouse button down while the mouse pointer is in the header of that window and dragging the window to the desired position.
- **Resizing windows**: The Map and List windows can be resized by using the mouse to grab and drag the (Resize) button in the bottom right corner of the window.
- **Window Focus**: A window can be brought from behind other windows by clicking the mouse anywhere in its window body or header.

Zoom to Map Feature

At the top of the device and event windows, there is a Zoom to Map feature that allows the user to view where on the map the device or event is located. Clicking on the Zoom to Map icon zooms the map to the location of the device or event and displays the item in the center of the map.

Filtering Toolbar

At the top of most viewer windows, there is a filtering tool that allows the user to choose which devices or elements that will be displayed. Since the user is mainly concerned with their region of responsibility, the filter allows the user to set which region to view so that the number of devices being displayed is reduced.

Icon Actions

The device and event icons in the ATMS can have two actions placed on them: “Drag and Drop” and “Click to Open.”

Drag and Drop

Device and Event icons in the ATMS map and list windows have a ‘Drag and Drop’ capability. These icons can be dragged onto a Viewer window, an Inventory window, or a Multi-Viewer window for viewing details about that device or event.

Click to Open

Device and Event icons in the ATMS map and list windows have a ‘Click to Open’ capability. These icons can be ‘Left-mouse-clicked’ to open the device or event into a Viewer window.

Base Modules

Map

The Map module is a highly detailed, geographically precise map that provides a real-time interactive interface that enables easy access to sensors and controllable field devices. The system can be configured to use a variety of

mapping sources, including ESRI (Imagery, Street, Topographical), Google API, OpenStreets, Bing, and DM Solutions, among others.

The iNET ATMS map view is comprised of a map background and feature class layers that are overlaid on the background. The map background is a pre-generated set of map tile images that are generated for each zoom level and contain map features that automatically become included at each zoom level. The map background contains features such as roadways, city and county boundaries, and labeling/annotation. Other than changing to another zoom level, the user has no control over what is displayed on the map background. However, the iNET ATMS map does contain a suite of feature classes that are listed in the map legend whose visibility can be controlled. The following sections will describe how to navigate the map and how to include feature classes on the map to support the operator in his or her traffic management activities.

Map Legend

The Legend window can be opened by clicking on the Open Map Legend icon near the top left of the Map window. The legend explains the different icons and colors used on the map. The legend can be closed by clicking on the same Key icon. The Legend has a tear-away feature that allows the user to move the legend for that element off of the map window. When placed in tear-away mode, a smaller version of the legend is placed on the desktop, off the main map window. To utilize tear away mode, simply click on the diagonal arrow in the top-right side of the respective key.

Viewing other Maps or Specific Geographic Areas

The ATMS provides an organization with the ability to manage multiple map backgrounds for specific geographic areas that can be referenced by name (e.g., cities or corridors). These maps or navigation to these areas are accessed by selecting an entry from the map Shortcut drop down box. Clicking on an entry in the map selection drop down box will alter the map view to include the map background, the map extent, and the map zoom level as stored with the specific map selection name. The map legend icons will continue to be overlaid properly in the newly selected map.

Map Controls

By using the Switcher Bar at the bottom of the Map window, icon types can be turned on (blue) or off (black) in the map display. The icons can also be turned off by opening the map legend and de-selecting the icon type (i.e., by clicking in the legend in check box area if one exists, or on the icons themselves if there is only one type).

Icons & Icon Layering: Icons are layered on the map by type or feature class. By default, icons are configured to be displayed at certain zoom levels. This keeps the map from appearing cluttered with icons at the top levels. Icons that are higher on the list are displayed above or on top of any icons below on the list and will take precedence in the tool tip information that is displayed. If two icons occupy the same geographic position, the icon layer visibility may need to be toggled off to access the underlying icon. The zoom levels at which icons appear can be set by the user. This is accomplished using the Icon Layering tool located in the map legend.

Alert

The Alert window allows users to view the health of the system. The Alert window reports any device failures, severe weather conditions, as well as severe traffic conditions or events received from external systems. For alerts due to weather conditions or alerts due to traffic conditions, an ATMS event can be generated directly from the Alert window. Alerts are categorized by severity: Severe, High, Moderate, and Low.

What is shown on the list of alerts can be configured by using the *Filter* link.

List Window

The List windows provide access to lists of devices owned by the organization, a list of events that are occurring in the system, or a list of contacts maintained by the organization. The current travel times can also be viewed.

The default List window is a blank window with a switcher bar at the bottom that displays the types of lists that can be generated. To bring up a List window, click the *Launch List* icon on the navigation pane on the left.

List Window for Devices

For devices (e.g., AVL, ATM-CDR, ATM-GTY, BWTMS, CCTV, Contacts, DMS, ESS, Event, Parking, SCH, TT, and VDS), the List windows contain a summary of information about the device. To select a particular list, click on the device type in the switcher bar. The list will contain a type icon, the agency-defined ID, the location information, and status. The icon can be dragged from the List window and dropped into Viewer, Multi-Viewer, or Inventory windows to access either control or inventory functions. The list can be filtered by clicking on the column title. A small pop-up window will appear with a text box for entering the filtering criteria. An example of a List window containing the DMS appears below.

Multi-Viewer Windows

The Multi-Viewer windows allow the operator to group devices of different types and/or events together into one manageable unit. For example, an operator can place event information, the CCTV nearest the event, and the DMS nearest the event onto one Multi-Viewer window so that all the pertinent information can be viewed simultaneously. This grouping of information can be named and saved for later recall.

This can be particularly useful in situations where the same group of DMS or cameras are used repeatedly, such as in sporting events. Because this set of cameras and DMS can be grouped, saved, and named, the operator can recall this set of devices the next time there is a game.

The Multi-Viewer windows are an extension of the Viewer, List, and Map windows. A regular Viewer window can house different types of devices or events, but only one at a time. The Multi-Viewer window can hold multiple devices of different types and multiple events simultaneously. If there are four DMS and four cameras near the stadium, the operator would have to open eight individual regular Viewer windows (i.e., four DMS and four cameras) to manage the traffic. Using the Multi-Viewer window, the operator would only have to use one Multi-Viewer window.

System Administration and Security (SAS)

The System Administration and Security (SAS) module exists to meet the dynamic security and operational needs of end users. This module enables user account management and access and control rights to the various functions of the system on a per-user, per-group, or per-device basis. Global system parameters, such as alarm thresholds, are also configured through this module.

ATM-CDR Module

Using the ATM Corridor System

This section describes how to manage ATM Corridors. It includes monitoring the status of an ATM corridor and all relevant elements within that corridor; as well as managing ATM operation at the hard shoulder running, speed advisory, and lane control levels.

To open an ATM Corridor Viewer window, first click *List* in the upper menu bar and *ATM-Corridor* in the lower switcher bar, then click on the desired corridor. An ATM Corridor icon may be dragged and dropped from the Map or List windows to a Viewer window as well.

In addition to the standard header and the Switcher Bar, the ATM Corridor Viewer window has the following tabs (Circled in red in):

- Operational Status tab  : Displays the current operational status of all ATM DMSs and LCSs, VDS stations, and ATM Gantries within the corridor; as well as the sign messages and speeds currently in effect.

- HS Activation tab : Allows the operator to monitor and control HS operation within the corridor
- Variable Speed tab  : Allows the operator to monitor and control variable speed operation within the corridor
- Lane Control tab  : Allows the operator to manage lane control operation within the corridor

ATM Corridor Privileges

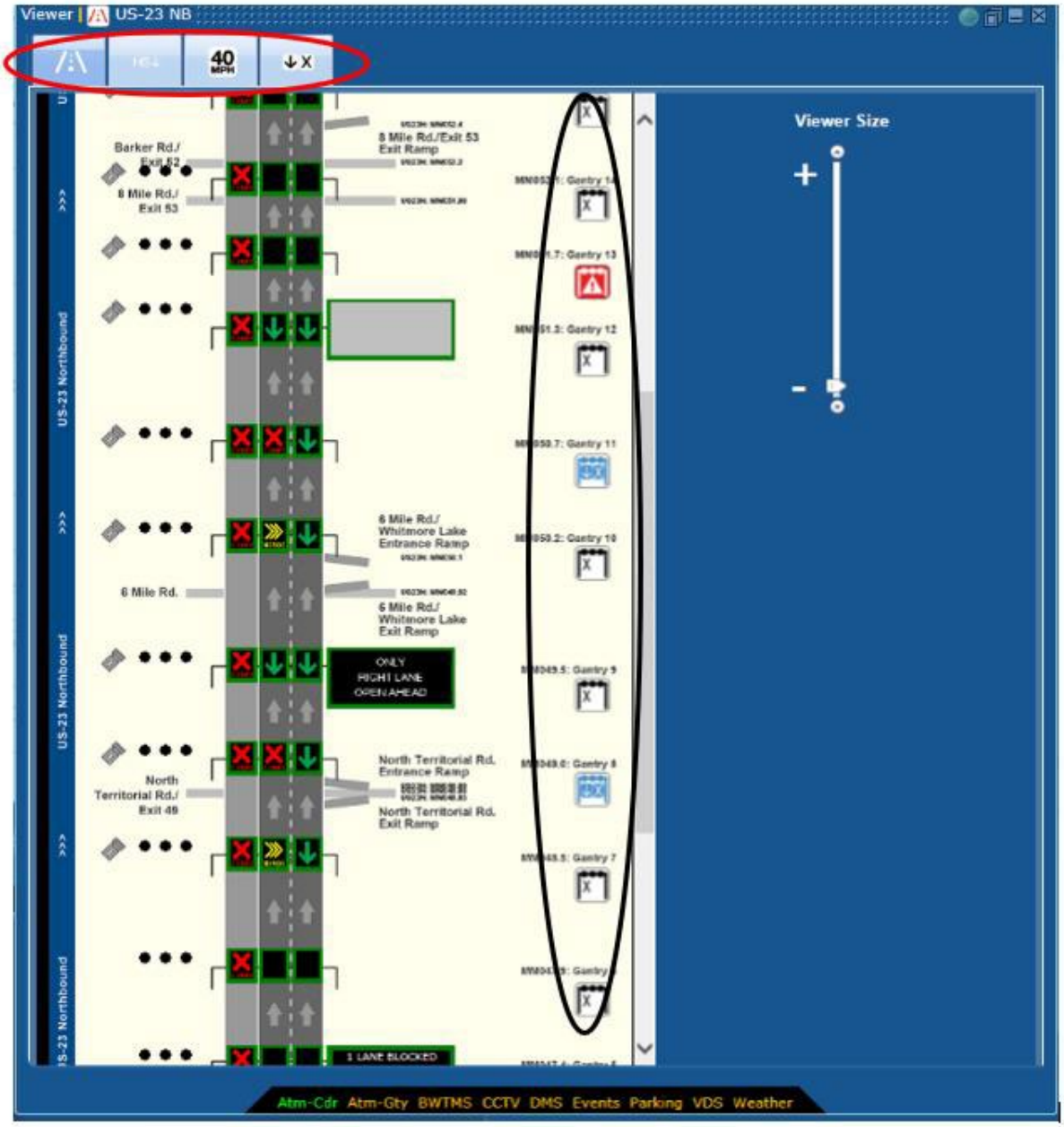
The privilege which allows users to operate the ATM Corridor is *ATM Control.*

The *ATM Supervisory Control* privilege extends the ATM Control privilege to allow users to ignore errors when applying hard shoulder running and lane control signing, to reject scheduled hard shoulder changes, and to set the variable speed override operation to “enable” for a hard override.

If the operator has no ATM Control privileges set, the ATM Corridor Viewer will open in View-Only mode. In View-Only mode, a user can view the details of the ATM Corridor. The user cannot control the ATM Corridor.

Monitor the Operational Status of the Corridor

2FIGURE: ATM CORRIDOR VIEWER WINDOW (OPERATIONAL STATUS TAB)



The operational status tab displays the current operational status of all ATM elements within the corridor. The visible extent of the corridor can be controlled using the slider bar on the right-hand side of the window. The same gantry and VDS icons that appear on the Map window and List viewer window are used to represent the VDS and gantries within the corridor (Circled in black in figure above). As with the Map window, additional relevant information can be displayed by hovering the mouse pointer over these icons, see figure below. Individual sign symbols display the current LCS and DMS messages as reported live from the field, with the border color indicating the status of the sign (where green indicates the sign is operational, red indicates a failure, and gray indicates that the sign is deactivated). The icons in the Operational Status Tab can also be clicked, like on the Map window, and a Viewer window

corresponding to the device selected will open. See Figure ATM Corridor View 2. A CCTV Viewer window opens when the CCTV icon on the Operation Status Tab is clicked.

FIGURE: ATM CORRIDOR VIEW 1

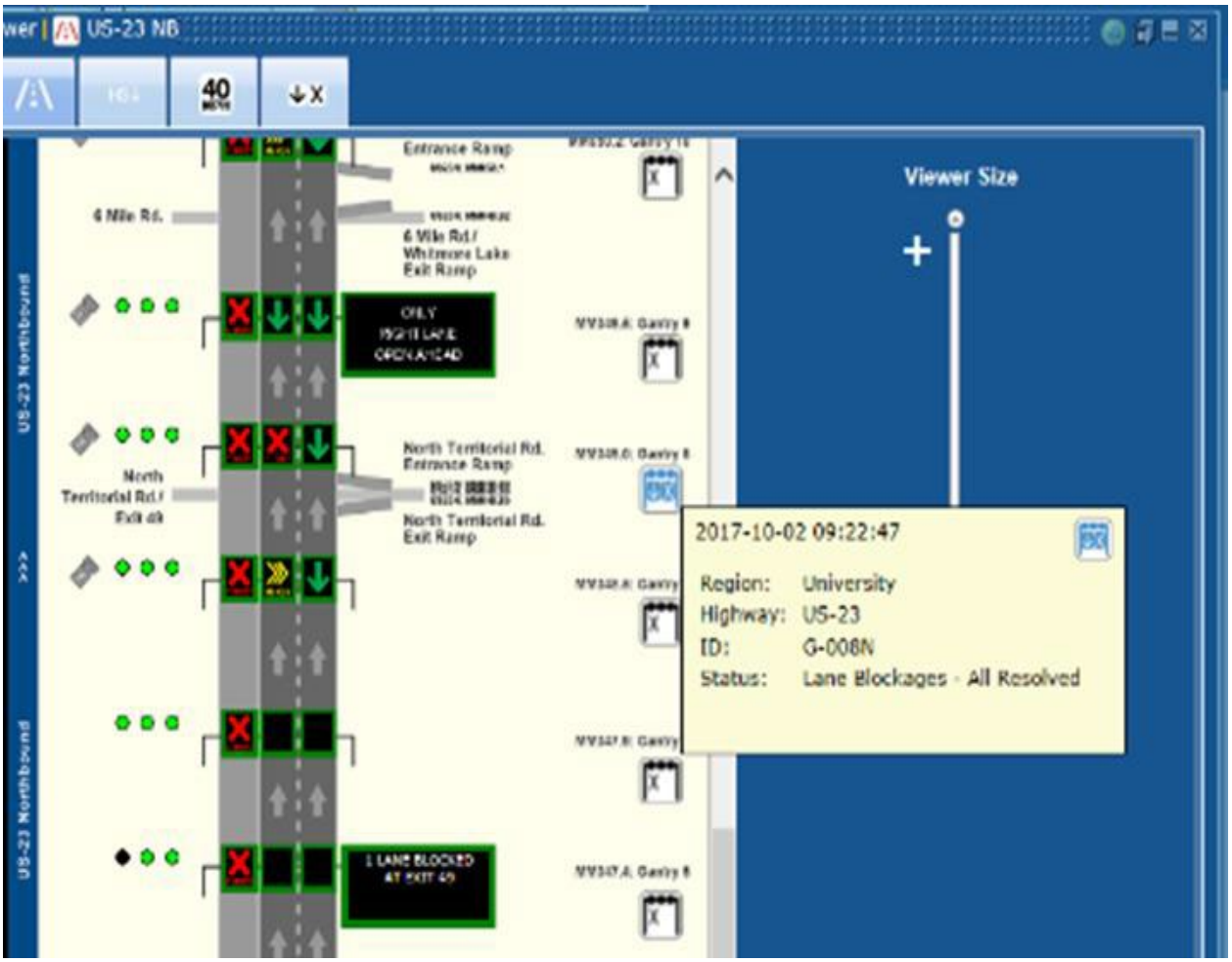
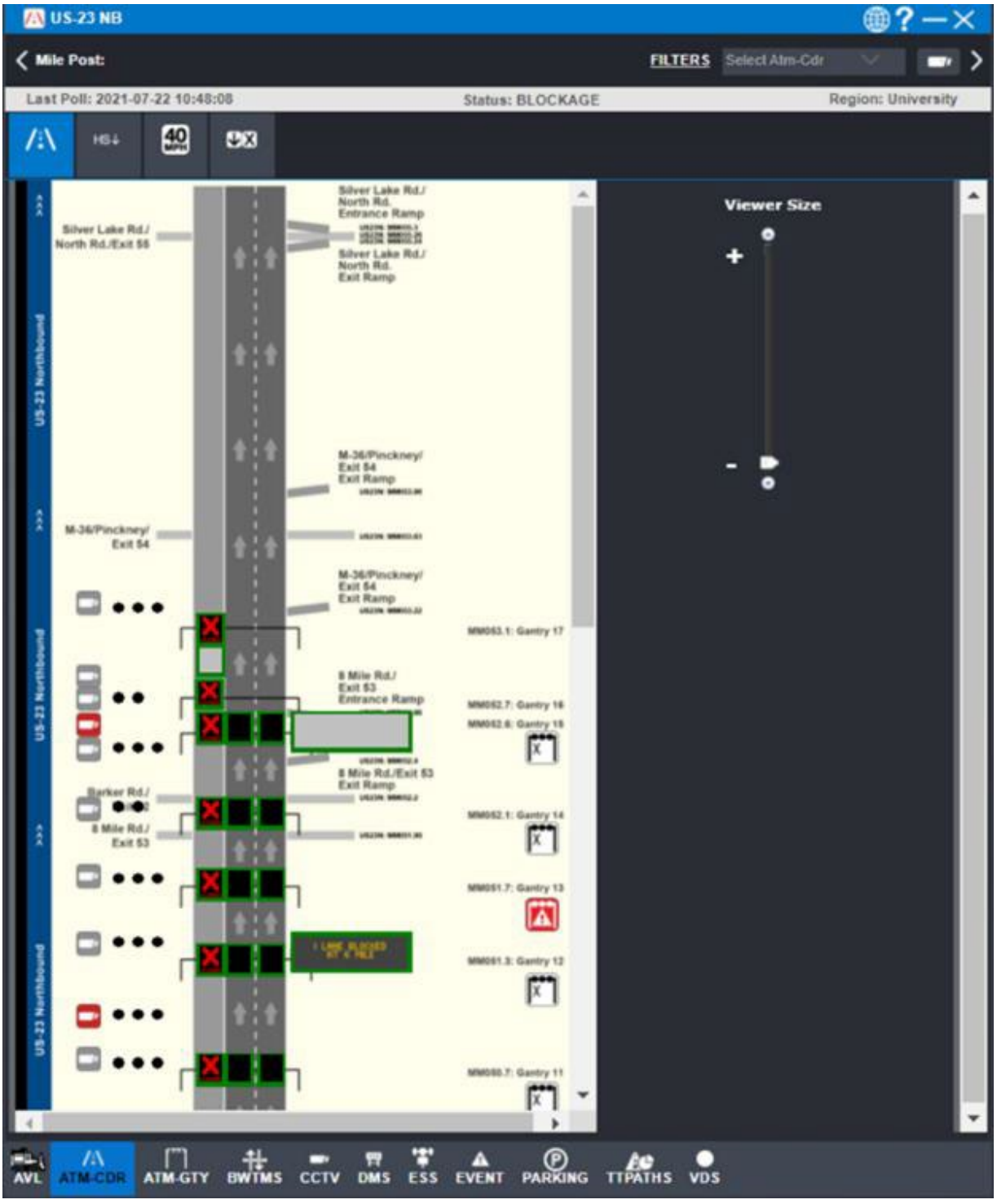
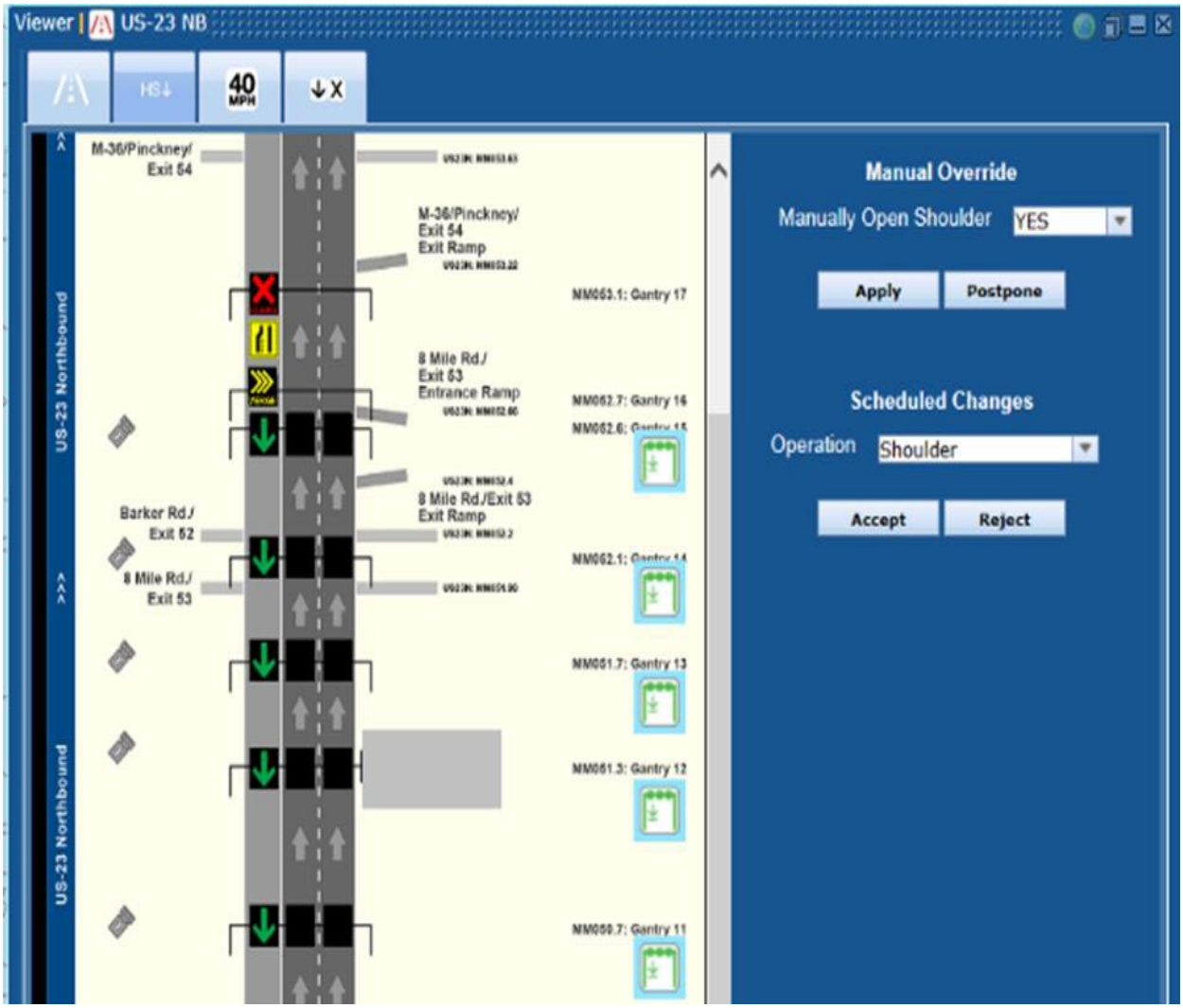


FIGURE3: ATM CORRIDOR VIEW 2



Monitor and Control HS Operation within the Corridor

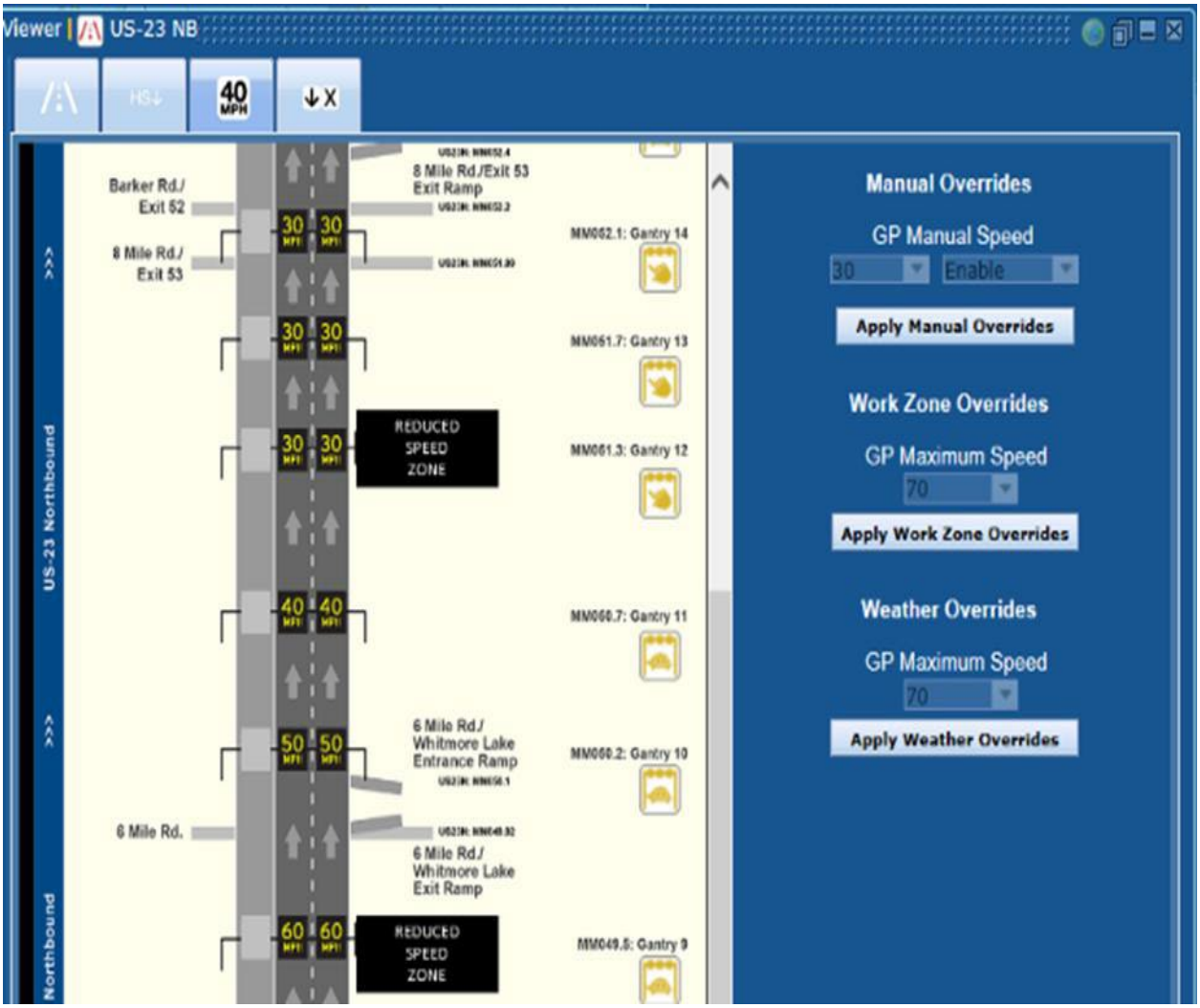
FIGURE: ATM CORRIDOR VIEWER WINDOW (HS ACTIVATION TAB)



The HS Activation tab allows the operator to monitor and control HS operation within the corridor. The same gantry icons that appear on the List viewer window (HS Activation tab) are used to represent the gantries within the corridor. As with the Map window, additional relevant information can be displayed by hovering the mouse pointer over these icons, see figure below. Individual sign symbols display the resulting LCS and DMS messages for HS operation.

Monitor and Control Variable Speed Operation within the ATM Corridor

FIGURE: ATM CORRIDOR VIEWER WINDOW (VARIABLE SPEED TAB)

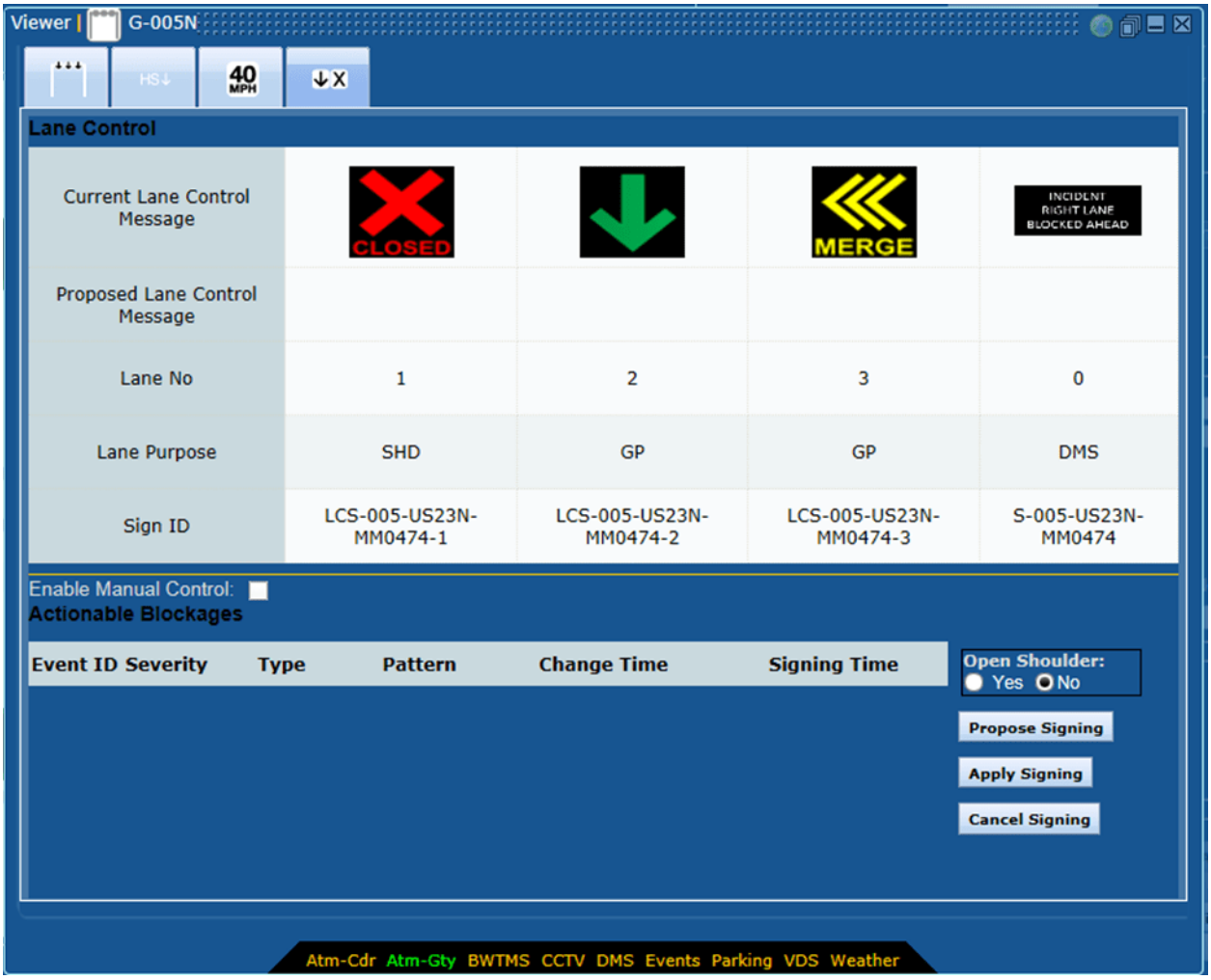


The Variable Speed tab allows a supervisor to monitor and control variable speed operation within the corridor. Operators will also be able to monitor the variable speed but will only have permission to post “SLOW” to the LCS. The same gantry icons that appear on the List viewer window (Variable Speed tab) are used to represent the gantries within the corridor.

As with the Map window, additional relevant information can be displayed by hovering the mouse pointer over these icons, see figure below. Individual sign symbols display the resulting LCS and DMS messages for variable speed operation. Supervisors can manually override the speed at any gantry, the 10mph stepping from gantries can be overruled by using this functionality, and therefore this should be used with extreme care.

Manage Lane Control Operation within the Corridor

FIGURE: ATM GANTRY VIEWER WINDOW – LANE CONTROL TAB



The Lane Control tab (shown in figure above) allows the operator to manage lane control signing in response to lane blockages at the gantry and open the shoulder. It is functionally equivalent to the corridor viewer Lane Control tab described in Section 4.5 but limited to a single gantry. The ATM Gantry is a good source to view gantry details but the main activation of ATM Response Plans should be done using the ATM Corridor Viewer Window.

Closed Circuit Television Camera (CCTV)

The CCTV module offers an end-to-end solution for viewing, controlling, and maintaining the cameras in the system. Standard features include camera control, camera presets, camera tours, video recording, camera locking, user priority override, and video wall control.

This section describes how to manage the organization's CCTV system. It includes viewing and controlling the cameras, managing camera presets, and managing camera tours.

To open a CCTV Viewer window, first click the *Viewer* icon in the navigation menu. Then, drag and drop the icon for the desired camera from the Map or List windows, or click the *CCTV* option in the Viewer window's switcher bar and select the desired camera from the drop-down list.

Opening the Tours Panel

The Tours panel can be opened by a permitted operator by clicking on the *Tours* tab on the viewer window. This opens a new panel with the previously defined tours for that camera listed and buttons for managing the tours.

Dynamic Message Signs (DMS)

The DMS module communicates with fixed and portable DMS signs of varying sizes to disseminate information to motorists. Contractor has a large library of DMS device protocols, including (NTCIP) v1, (NTCIP) v2, and other proprietary protocols.

This section describes how to manage the organization's DMS system. It includes viewing and sending messages to signs, using the DMS library, and managing the DMS queues. The DMS Viewer window is the central point of focus for accomplishing these tasks. Its use is described in this section.

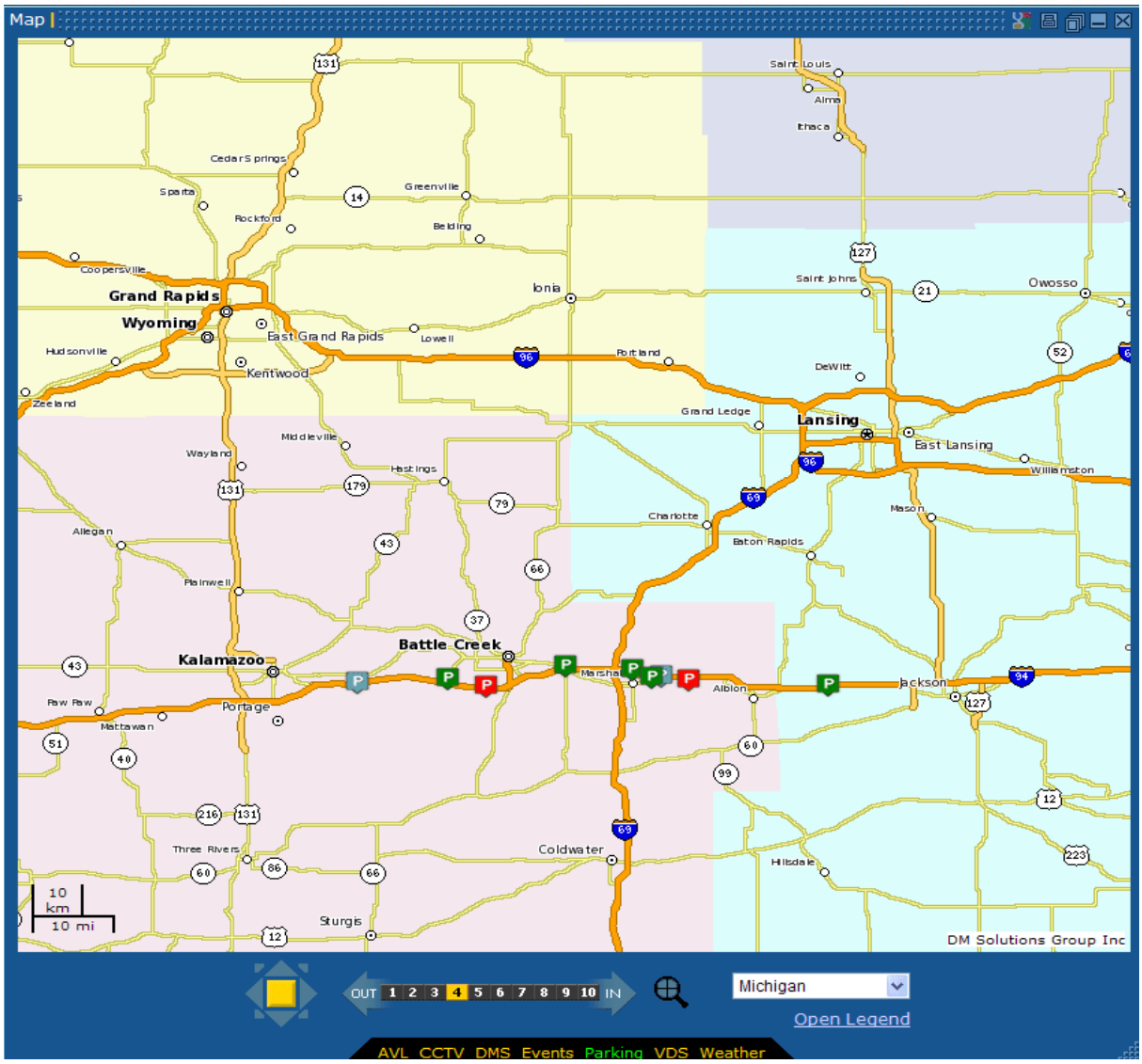
The DMS system is accessed by opening a DMS Viewer window. There are several ways of opening a DMS Viewer window

Truck Parking

This add-on to the base ATMS provides enhanced functionality in regard to truck parking locations and advanced notification for the road users.

The Map Window

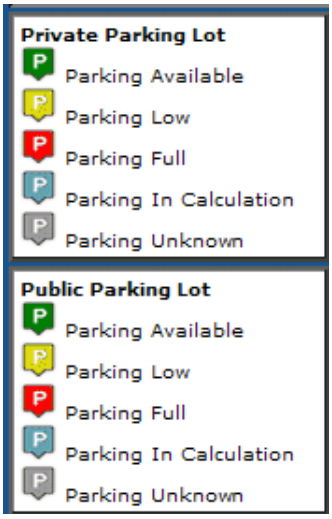
FIGURE: THE MAP WINDOW



Parking Legend

The Legend window can be opened by clicking on the *Open Legend* link on the bottom right corner of the Map window. The legend includes two sections for parking lot; private parking lot and public parking lot. See figure below for screen shots of the legend, which provides an explanation of the different icons and colors used on the map. These icons can be turned on or off by selecting the box and fully graying out the section found in the legend or by selecting *Parking* in the switcher bar until the word is highlighted in yellow.

FIGURE: PARKING LEGEND WINDOW



The List Window

FIGURE: LIST WINDOW – PRIVATE PARKING DISPLAY

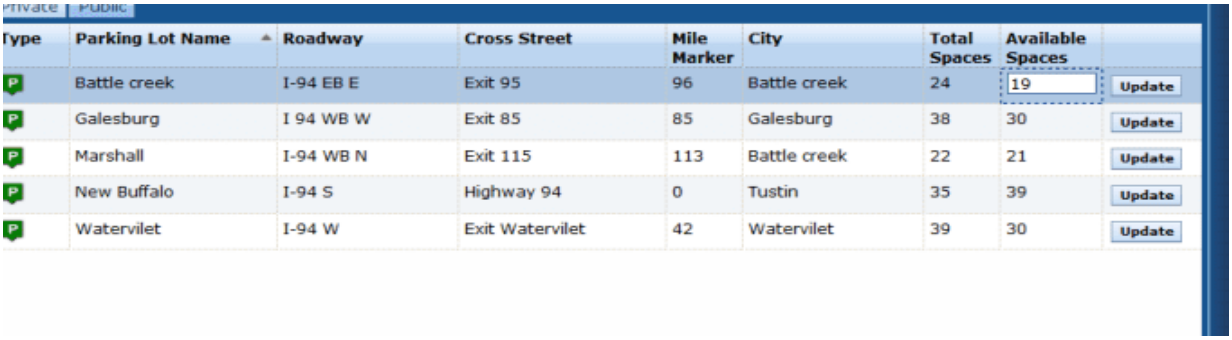
Type	Parking Lot Name	Roadway	Cross Street	Mile Marker	City	Total Spaces	Available Spaces
P	Arlene's Truck Stop	I-94 N	Exit-92	...	Battle creek	20	8
P	Dunes Auto Truck Plaza	I-94 N	Exit 12	...	Sawyer	15	6
P	Loves	I-94 N	Exit-112	...	Marshall	109	73
P	Parma Travel Center	I-94 N	Exit-128	...	Parma	60	44
P	Pioneer Auto Truck Plaza	I-94 N	Exit-110	...	Marshall	15	5
P	Plaza 1 Truck Stop	I-75 N	Exit 1	0	New Buffalo		0
P	Pri mar fuel center	I-94 N	Exit-29	...	Benton Harbor		0
P	TA Battle Creek	I-94 N	Exit-104	...	Battle creek	25	5
P	TA Travel Center	I-94 N	Exit 12	...	Sawyer	29	7
P	The 115 Truck Stop	I-94 N	Exit-115	...	Marshall	60	48

FIGURE: LIST WINDOW – PUBLIC PARKING DISPLAY

The Update Button

A feature in the Public Lots is the ability to calibrate available spaces to what is actually observed. This will have to be done periodically to ensure that communication or detection issues do not cause improper data. To update, click in the Available Spaces box and type the current value.

FIGURE: AVAILABLE SPACES UPDATING



Once the correct value is in the box, click update and the value will store in the system.

The Parking Viewer Window

A Parking Viewer window can be opened by clicking the *Viewer* link in the upper menu bar of the main screen. There are several ways to view Parking details in the Viewer window:

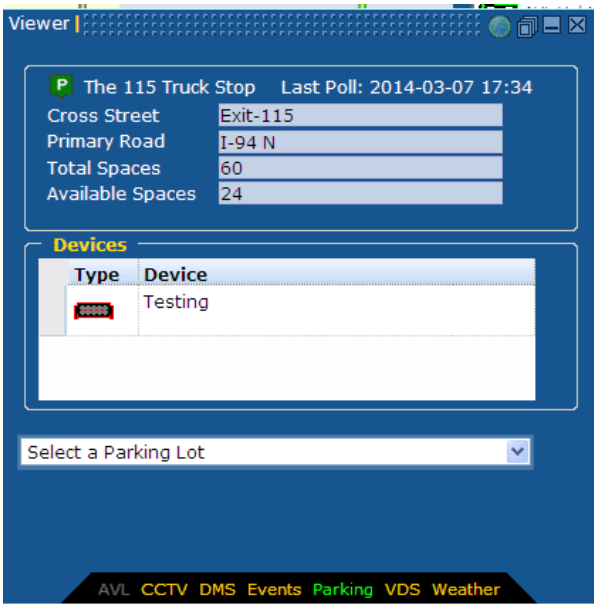
a) Drag and drop a Parking icon from the Map window to the Viewer window

b) Drag and drop a Parking icon from the List window to the Viewer window

c) Click on the Parking icon from the Map window

d) Click on the Select a Parking Lot drop-down box located at the bottom of the viewer window and choose from the list provided

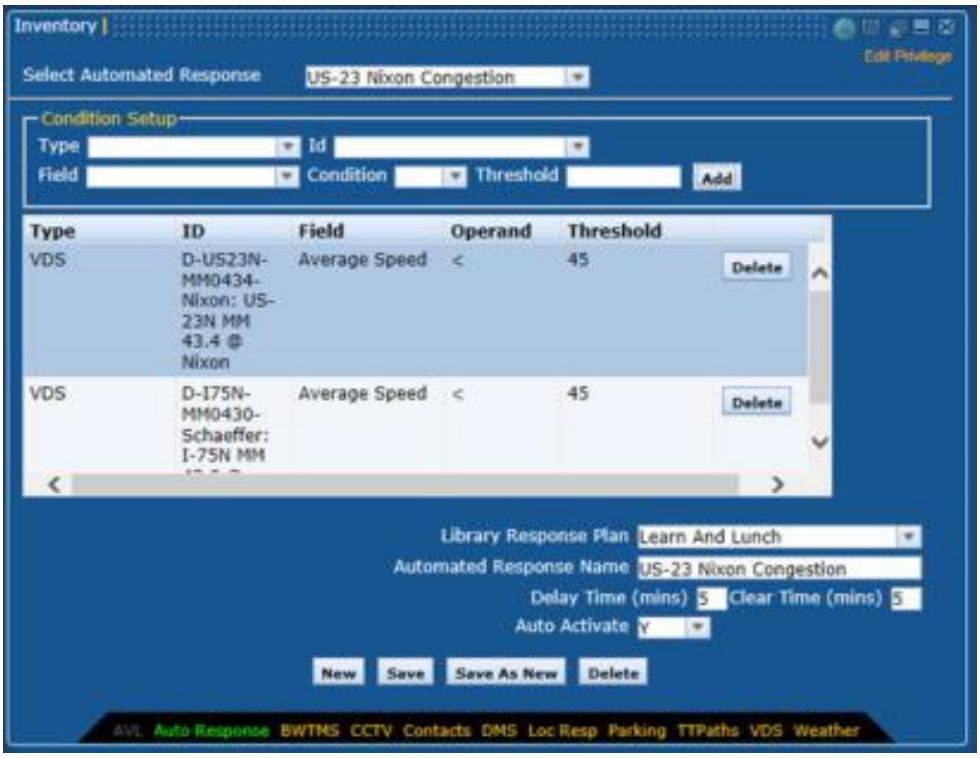
FIGURE: PARKING VIEWER WINDOW



Field Device Parameter-Based Responses:

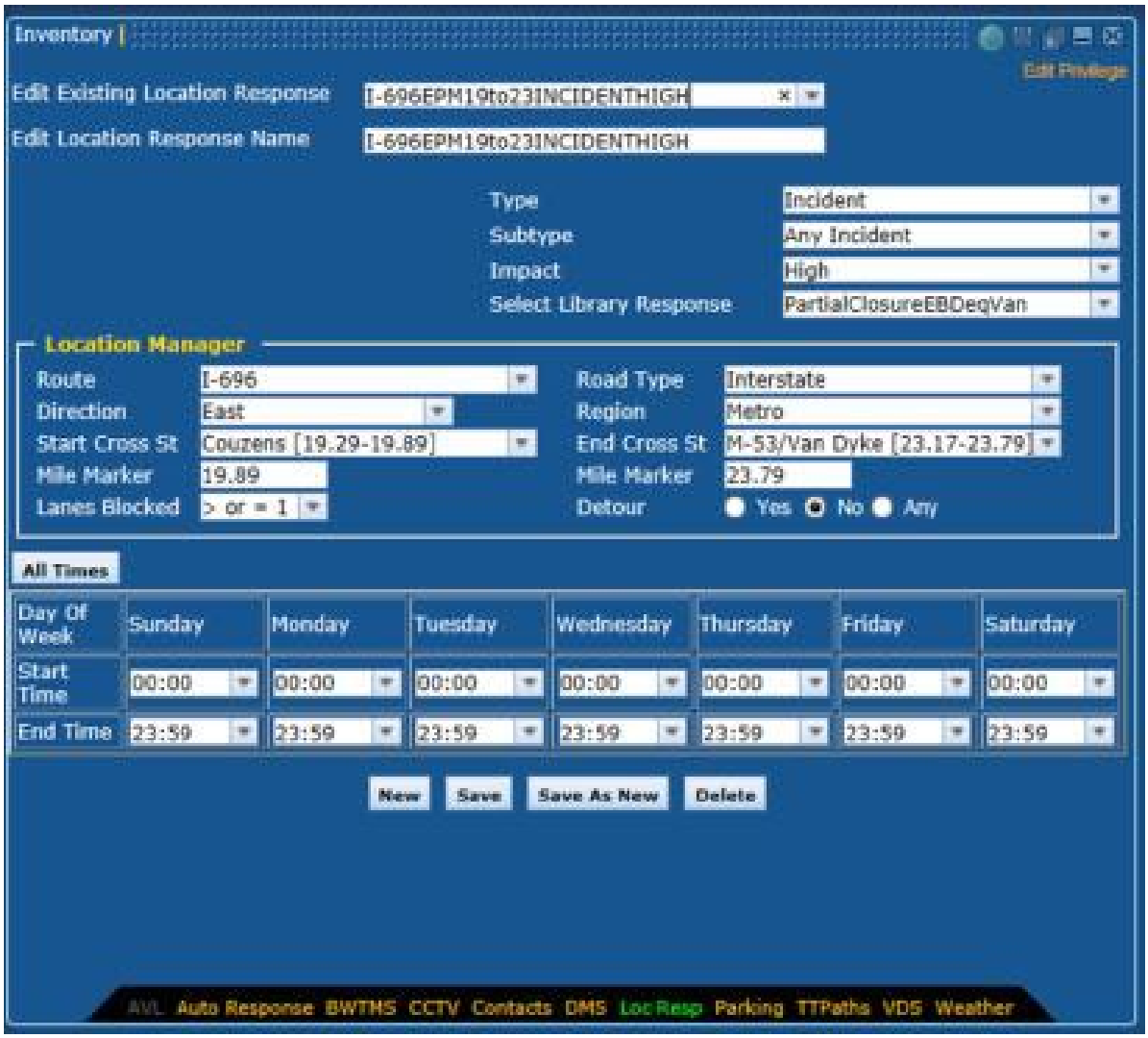
See figure below. Within the ATMS, an approved user can set up a full library response for DMS, ATIS, and operator actions and save that response in the ATMS Response Library. Then an operator can set up the system to automatically run a response when selected parameters are met. The user can select VDS, ESS, external data, parking lot status, or other data to use to trigger the response. See the included sample auto response GUI. In this case, the response is set to trigger when two VDS have speeds less than 45 miles per hour (MPH) for more than 5 minutes. Users can use as many devices as they want to set the rules for running the automated response. The response will automatically clear when the parameters are no longer met. Good examples of use for this functionality include, monitoring work zones, queue warning, icing on a bridge, park and ride lots full, and many others.

FIGURE: DEVICE BASED AUTOMATED RESPONSE



Location-Specific Response:

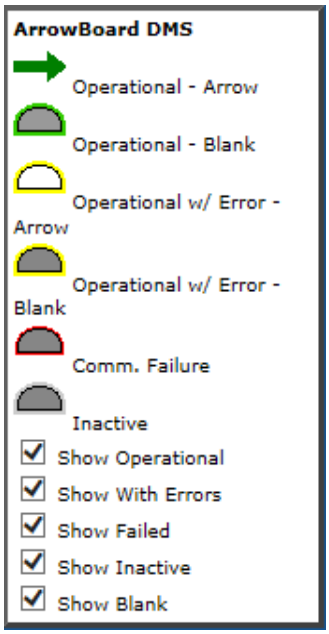
FIGURE 4: LOCATION BASED AUTO RESPONSE SETUP



These are typically used for special events, work zones, or unusual areas, or circumstances, in which a typical Response Matrix based responses may not apply. Through the Location Response window, users can set locations, times, and parameters in which a custom location specific response is used. When the parameters are met, within the times specified, the ATMS can automatically run the response, or allow for a visual clue to the operator that there is a location specific response that may be used instead of the Matrix response for this time and

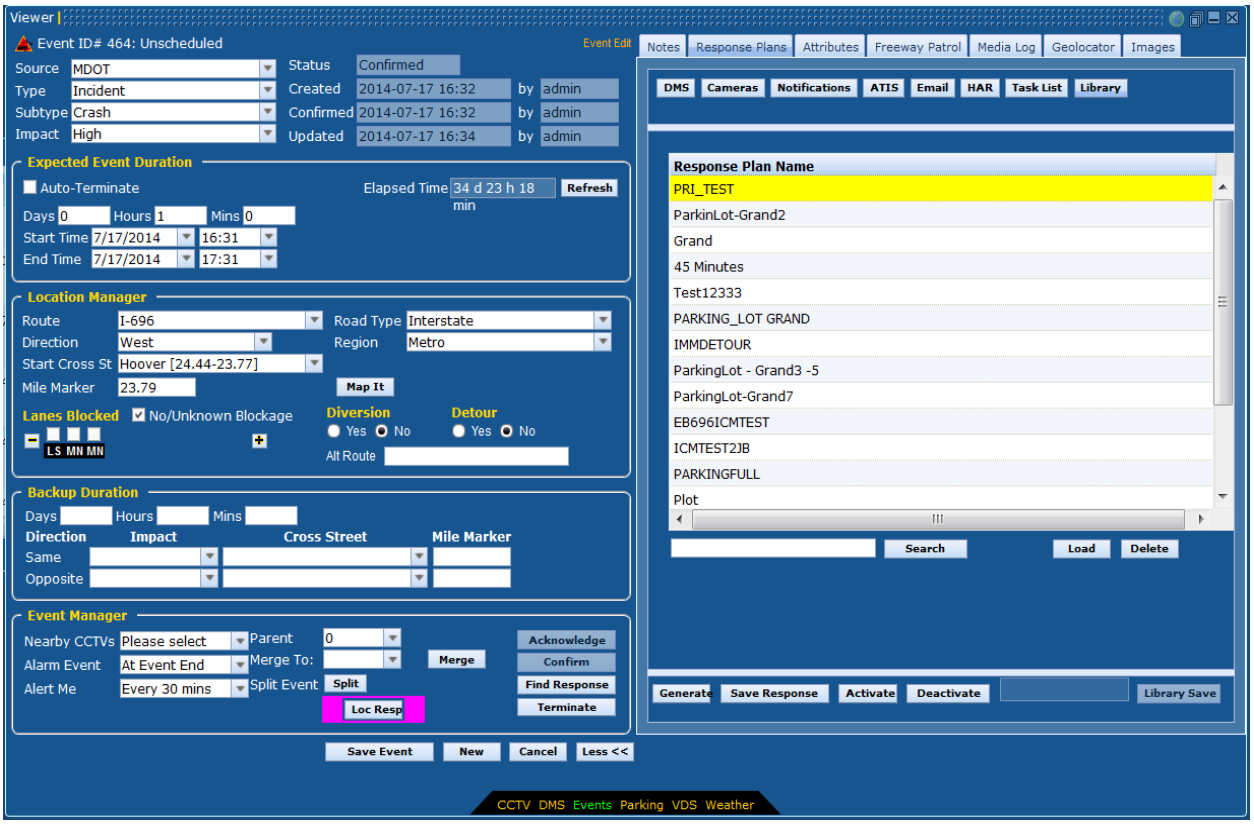
ArrowBoard DMS Legend

FIGURE 5: ARROWBOARD DMS LEGEND WINDOW



Clicking the “Loc Resp” button will open up the Library Tab in Response Plans, it will set timer for 30 minutes, after 30 minutes it will bring up event – viewer window with flashing icon and highlight all the library plans matching the location based on the configurations stored in the Location Response screen.

FIGURE 6: RESPONSE PLAN LIBRARY TAB WINDOW



Once they select the entry and click on Load or double click “plan name”, the selected plan will load in the Response Plan DMS tab as shown below.

FIGURE 7: RESPONSE PLAN DMS TAB WINDOW

Edit each sign with **the active sign selected and activate will activate the signs for those ArrowBoard DMS signs.** Clear Freeway signs clears out the 30 mins timer and set only 5 mins timer.

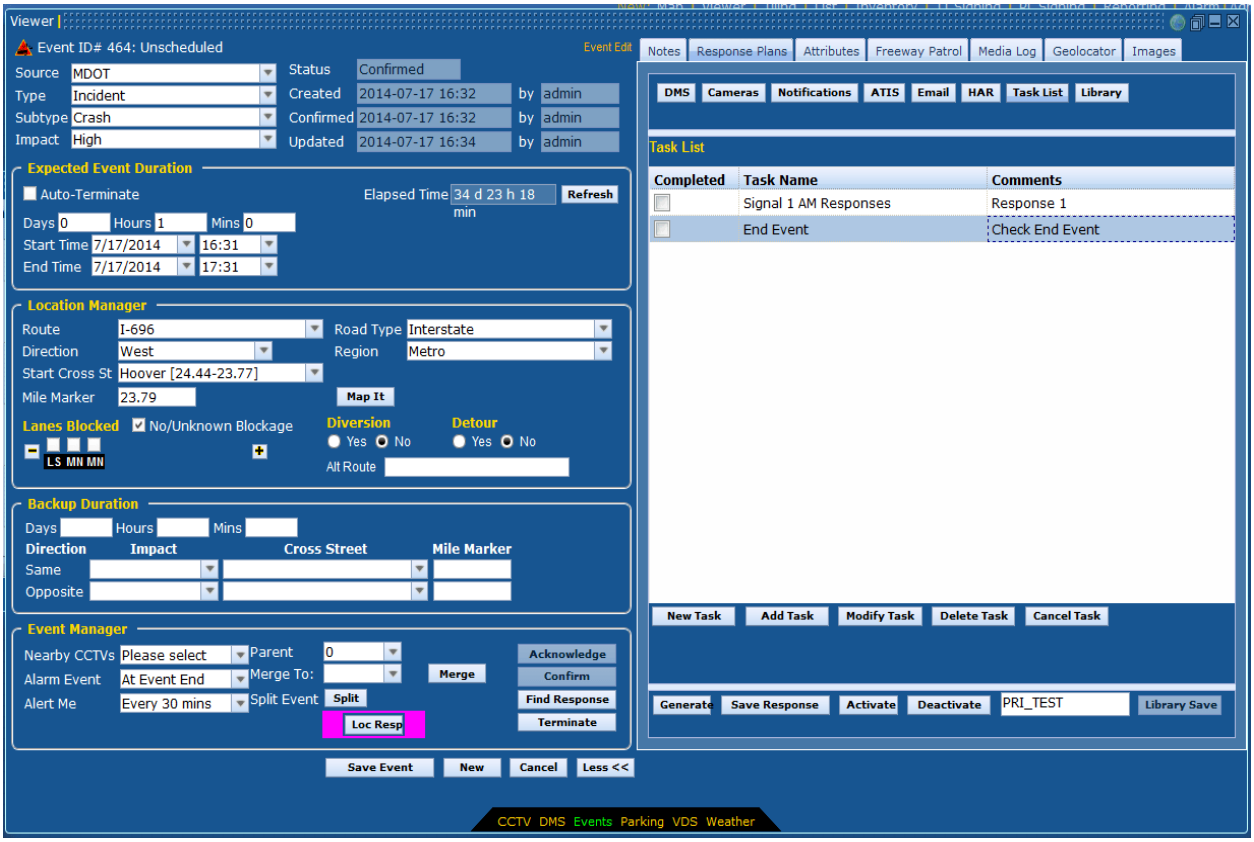
Using the Task List Window

Using the Task List window, users can type in as many tasks as they need.

1) New Task: Will create a new task
2) Add Task: Will be able to edit the task and add it
3) Modify Task: Will modify the task
4) Delete Task: Will delete task
5) Cancel Task: Will cancel the task which was added

Until all the tasks are checked (if any), the activate option should not be enabled on the DMS tab of response plan. If there are no tasks, then the activate option can be enabled.

FIGURE 8: TASK LIST WINDOW



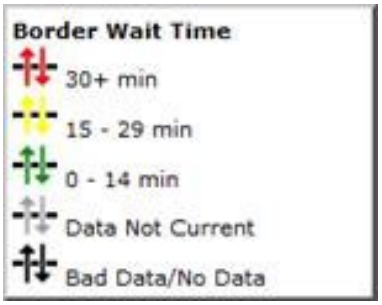
Using the Response Plan E-mail Window

E-mail tab shows a formatted message based on the Event (e.g., Event type, sub type, severity). This message is to be sent to the contacts dragged to the notifications tab. This message is to be sent when the response plan is activated and terminated.

Border Wait Time

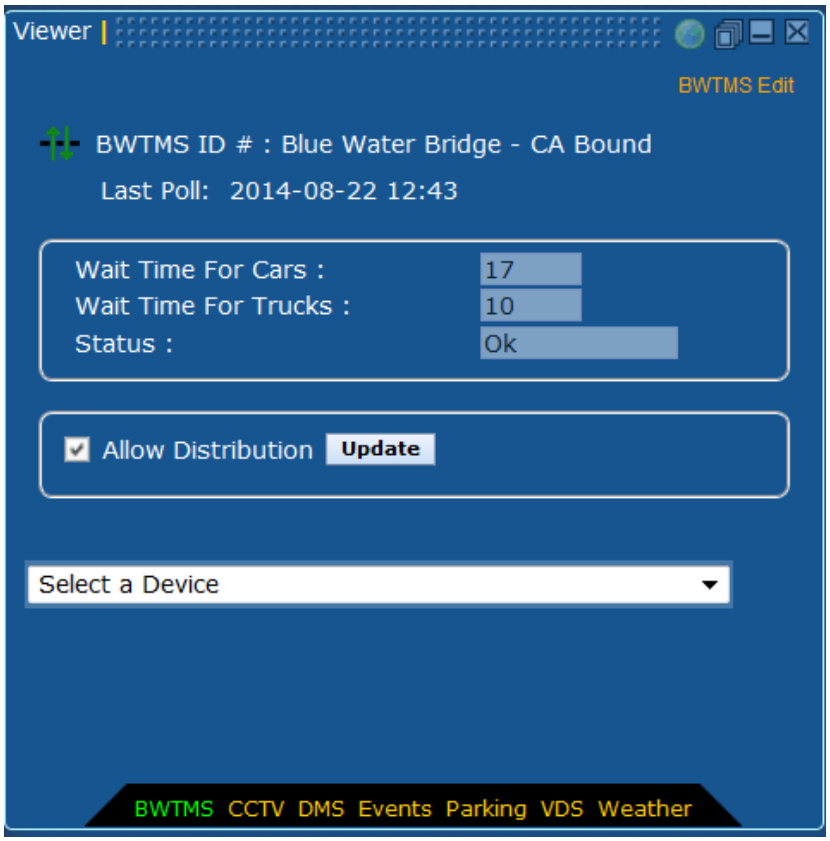
Border Wait Time Legend

FIGURE 9: BORDER WAIT TIME LEGEND WINDOW



The Border Wait Time Viewer Window

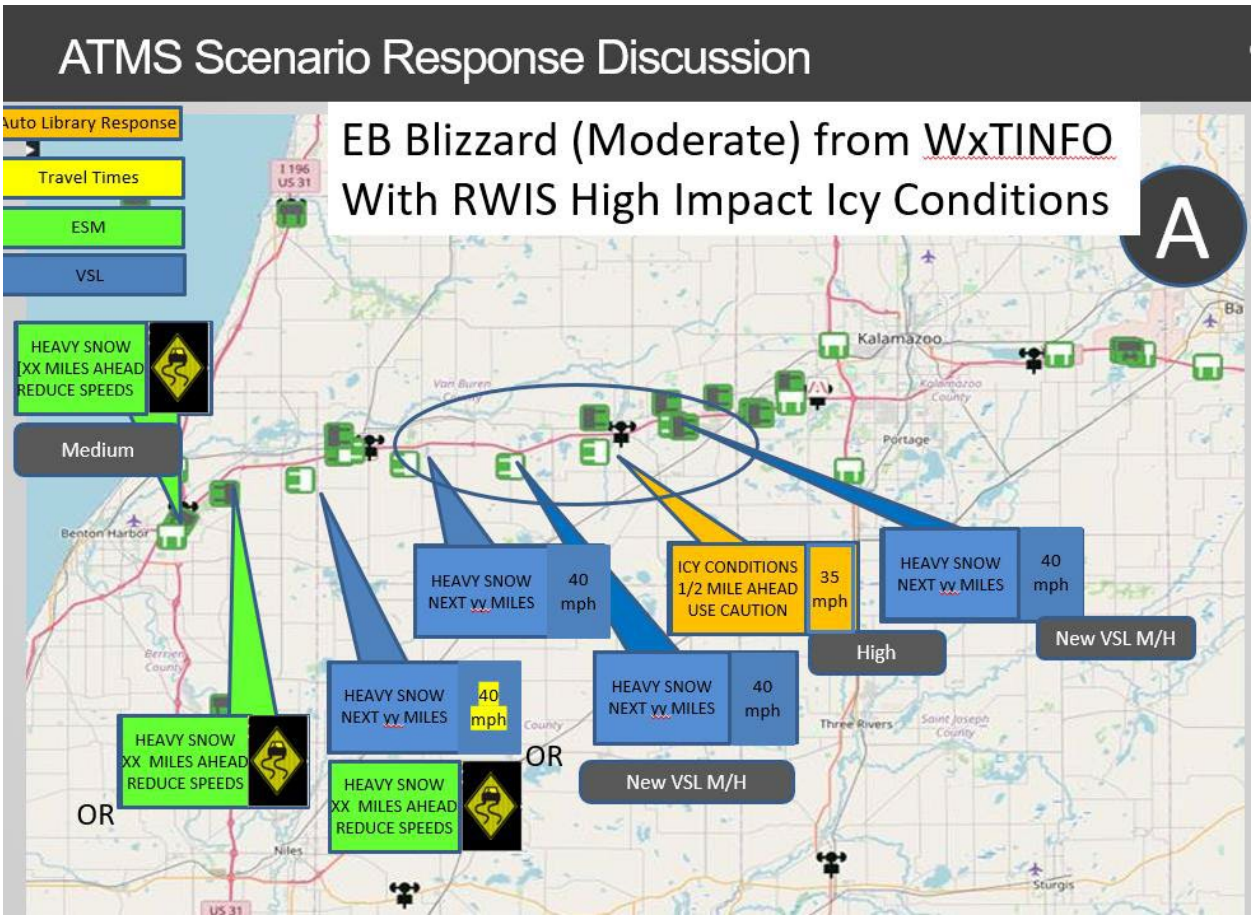
FIGURE 10: BORDER WAIT TIME VIEWER WINDOW



Area Weather

Area weather originally created the ability to change signs with a set response, but the recent Southwest VSA project has expended the area weather capability.

FIGURE 11: SOUTHWEST VSA OPERATIONS



Ramp Metering

This Contract adds ramp metering as a new module. Contractor has extensive experience with ramp metering and there is already a ramp metering module in iNET that can be ported to the MDOT system.

As part of the requirements review, Contractor will review the potential operational modes, such as SWARM, CARMA, or Fuzzy Logic, to help select the best solution for MDOT. On top of allowing for manual control, Contractor also offers configurable parameters to get the most out of the metering. Additionally, ramp metering can be used as a complement to the existing ATM corridors within Michigan. Below are screenshots and an excerpt from the Illinois DOT User Manual:

FIGURE 12: ATMS MAP AND VDS VIEWER

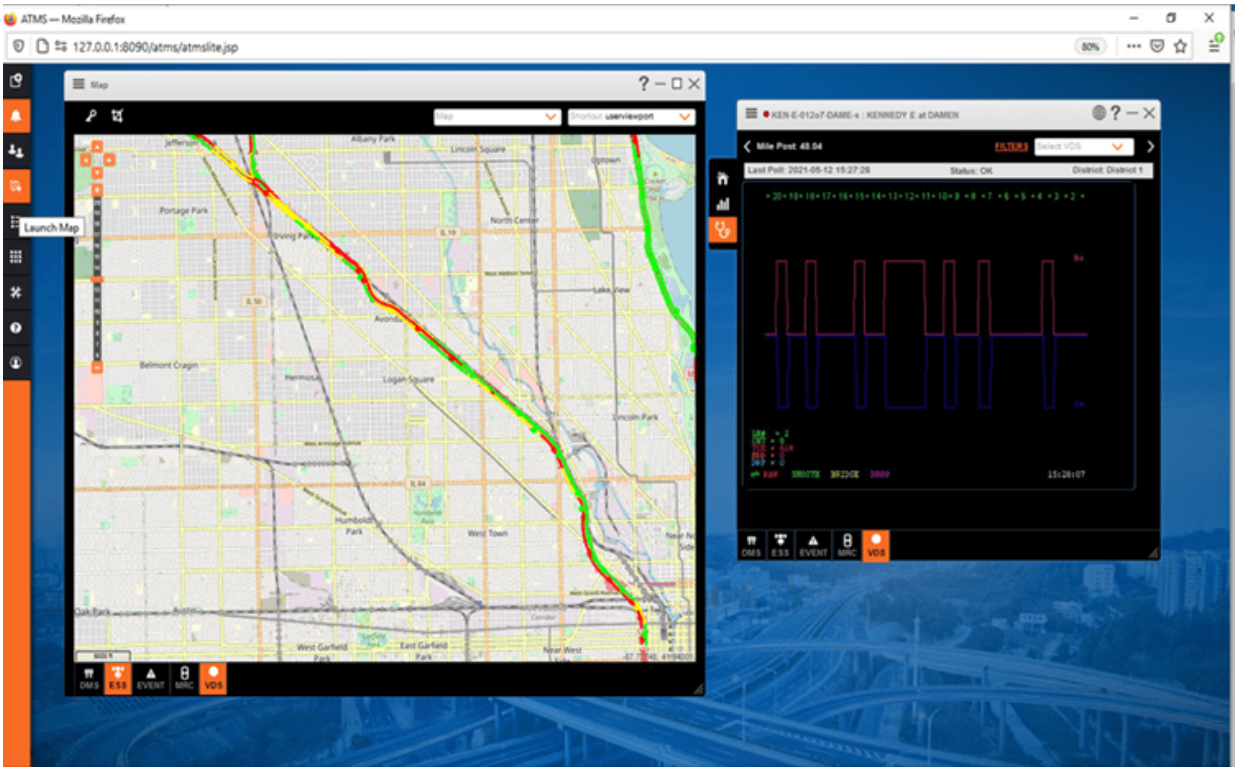
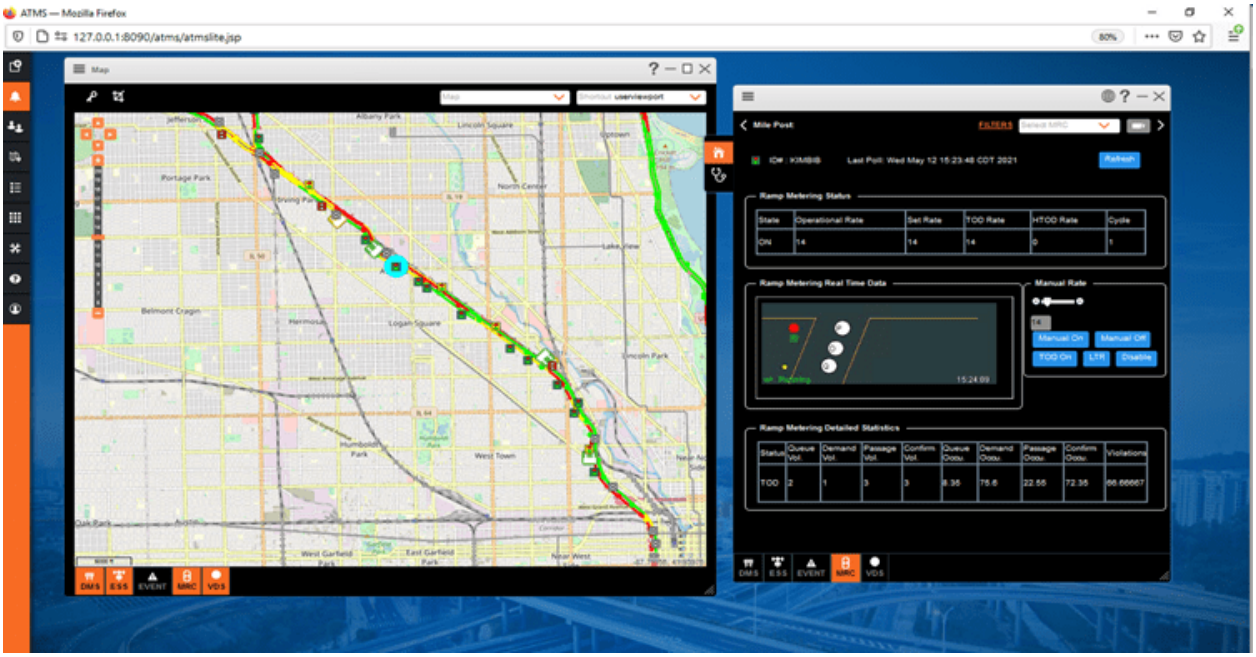


FIGURE 13: ATMS MAP AND RAMP METER VIEWER

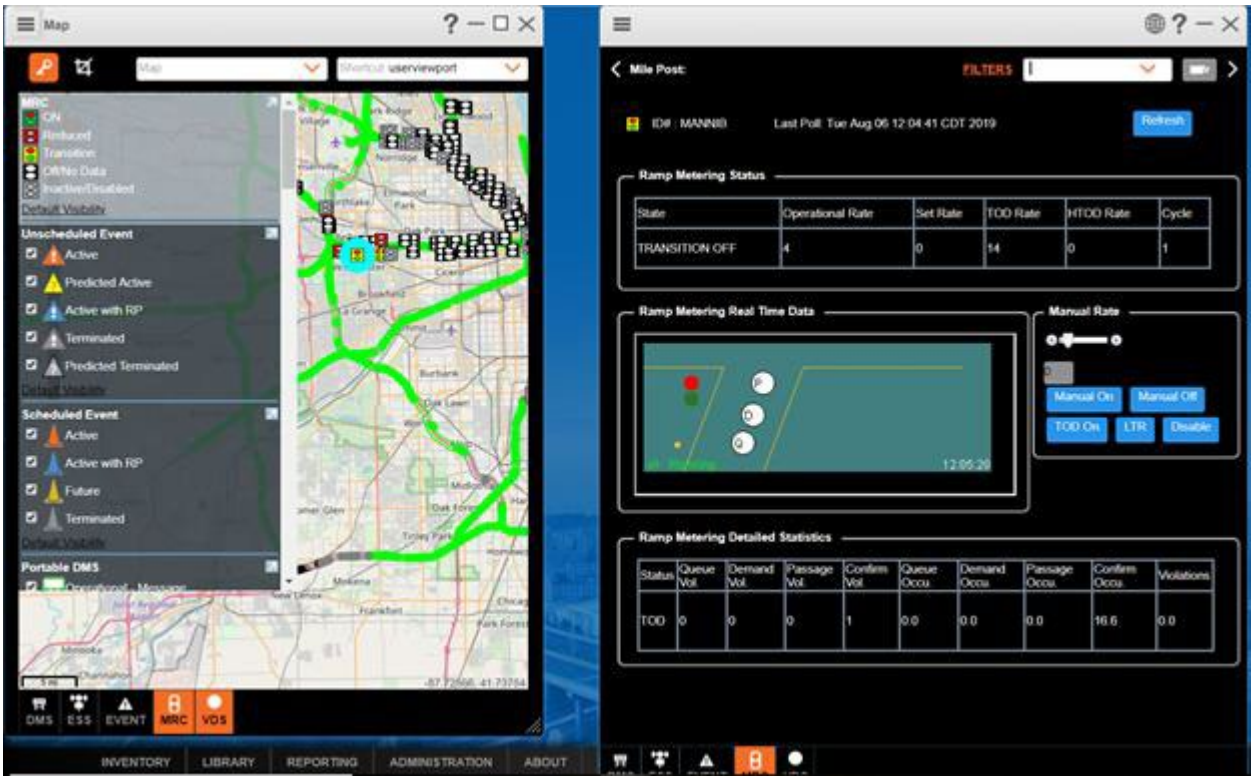


Using the MRC

The Metered Ramp Control allows control and monitoring of the Front End Processor(FEP) ramp meters through the intelligent Network interface.

View a map showing the ramp icons and the VDS icons. The Ramp icons are colored to show status information consistent with the legend.
View VDS information color coded to show levels of speed consistent with the legend.
View each ramp individually for status information.
View and Control parameters associated with each controller.
View and Control Strategies for controlling the queue behaviors.
View and Control the controller scheduler functions.
Control the Mode of operation

FIGURE 14: MRC INTERFACE



MRC Viewer

To view a metered ramp, either click a ramp icon or open a viewer window and drag a ramp icon into MRC viewer window.

The MRC Viewer is divided into three main areas.

Ramp Metering Status Field

RAMP METERING CONFIGURATION

FIELD NAME	ACTION
ID	Shows Ramp ID
Last Poll	Shows Last Poll date and timestamp
Operational Rate	Shows operational rate
Current Status	Indicates the metered Rate in number of vehicles per minute currently in use
Set Rate	Indicates the metered rate in number of Vehicles per minute set
TOD Rate	Indicate Current Time of Day Rate
HTOD Rate	Indicates Holiday Time of Day Rate
Cycle	Indicates Cycle information

Middle portion (Ramp Metering Real Time Data/Manual Rate) – When active, show the applet, which allows real-time viewing of the selected ramp. The display shows detector activations, signal states, and flasher states. In addition, Manual rates and ramp operation may be set. The following modes are available:

Ramp Metering Manual Rate

RAMP METERING ADVANCED SETTINGS

FIELD NAME		ACTION	
37	Manual On	38	This mode will set an operation rate based on rate slider
39	Manual Off	40	This mode will set releases the manual rate and turns the Ramp metering off
41	TOD on	42	This mode returns ramp metering to the TOD schedule defined for the ramp
43	LTR	44	This instructs ramp to operate on LTR mode
45	Disable	46	This mode stops all metering operation on the ramp and places it into a disabled mode

Lower portion of the Ramp Metering Window shows the Ramp Metering Details:

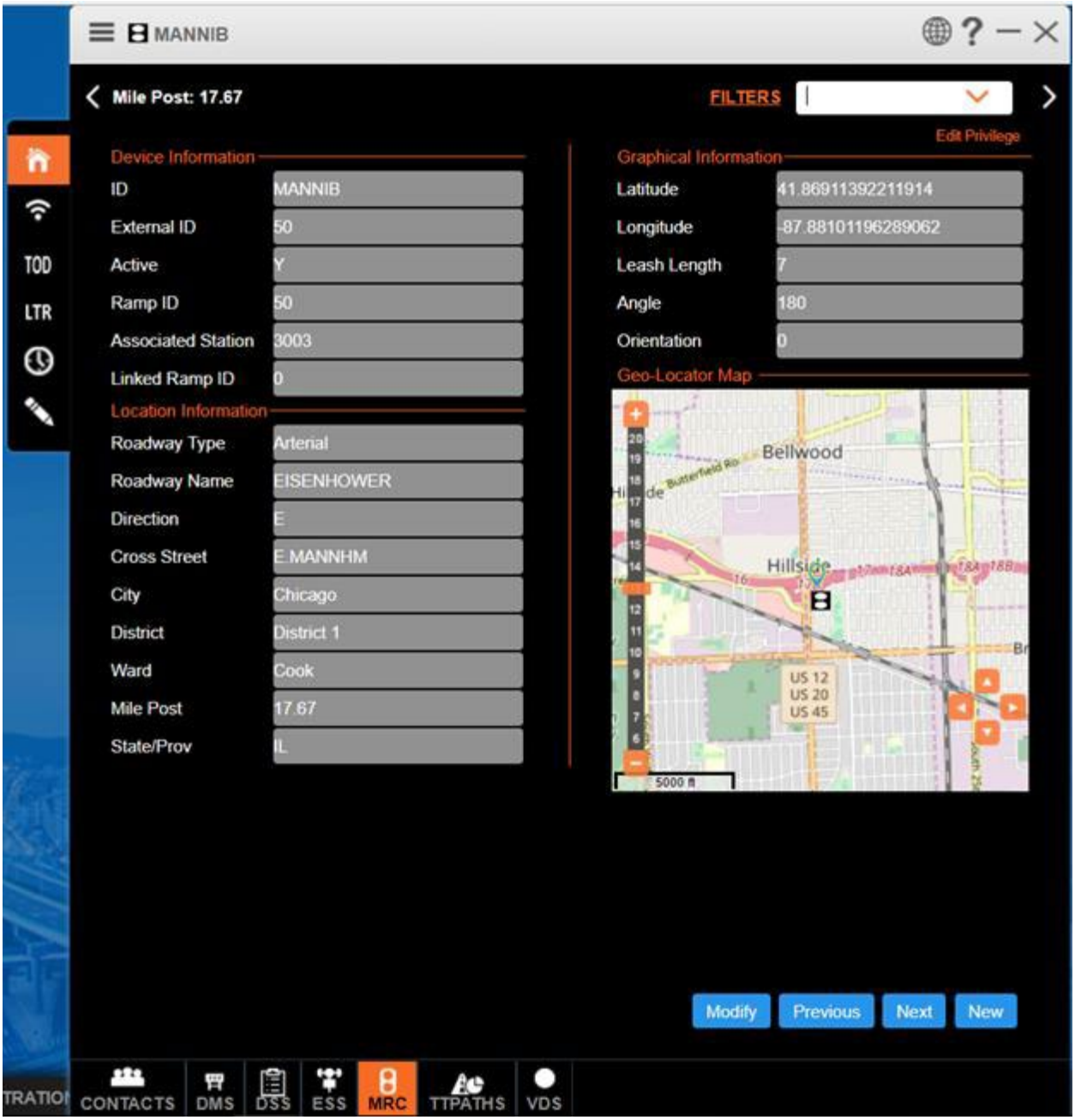
- Status
- Queue Volume
- Demand Volume
- Passage Volume
- Confirmed Volume
- Queue Occupancy
- Demand Occupancy
- Passage Occupancy

- Confirmed Occupancy
- Violations

Basic Controller Setup

FIGURE 15: MRC VIEWER

FIGURE 16: MRC INVENTORY



MRC Inventory Window

To create or modify a metered ramp, you need to view information through an Inventory Window. Open a blank Inventory Window and drag a selected ramp icon into the window (see image above).

The MRC Inventory window contains several tabs. Description of each tab is mentioned below.

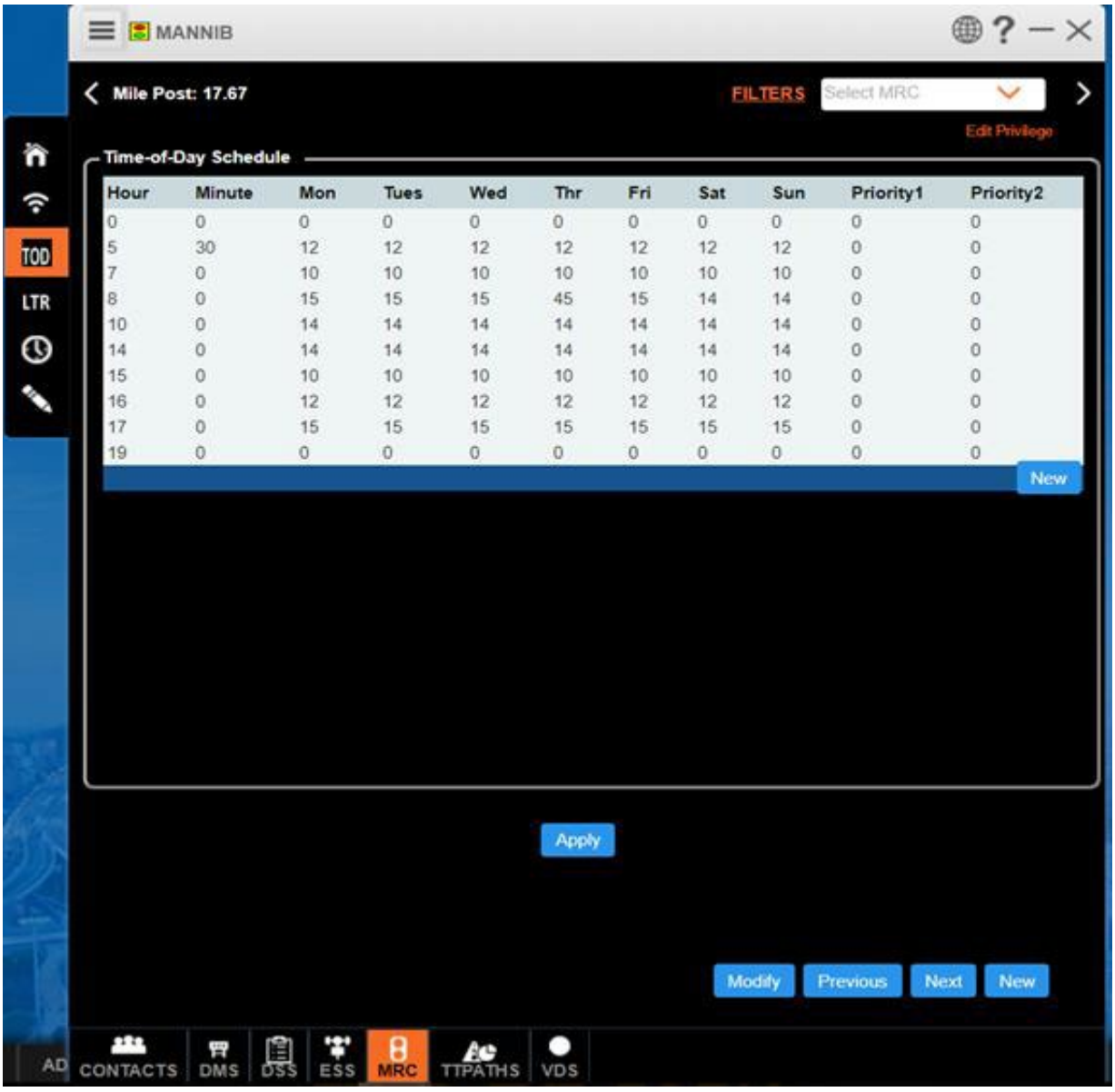
The Ramp Meter tab contains the following information, which can be modified or created via this window:

TOD (Time-of-Day)

The TOD tab allows the user to set parameters for any chosen MRC as desired. Here, a user can choose a specified time of day for the MRC to activate, can select what days of the week to do so, and can set a priority level for the specified MRC schedule.

TOD can be set up one of two ways. The user can go by rate (how many cars per minute pass through an MRC), or the user can go to a series of presets on the TOD table (which can also be edited).

FIGURE: TOD TAB



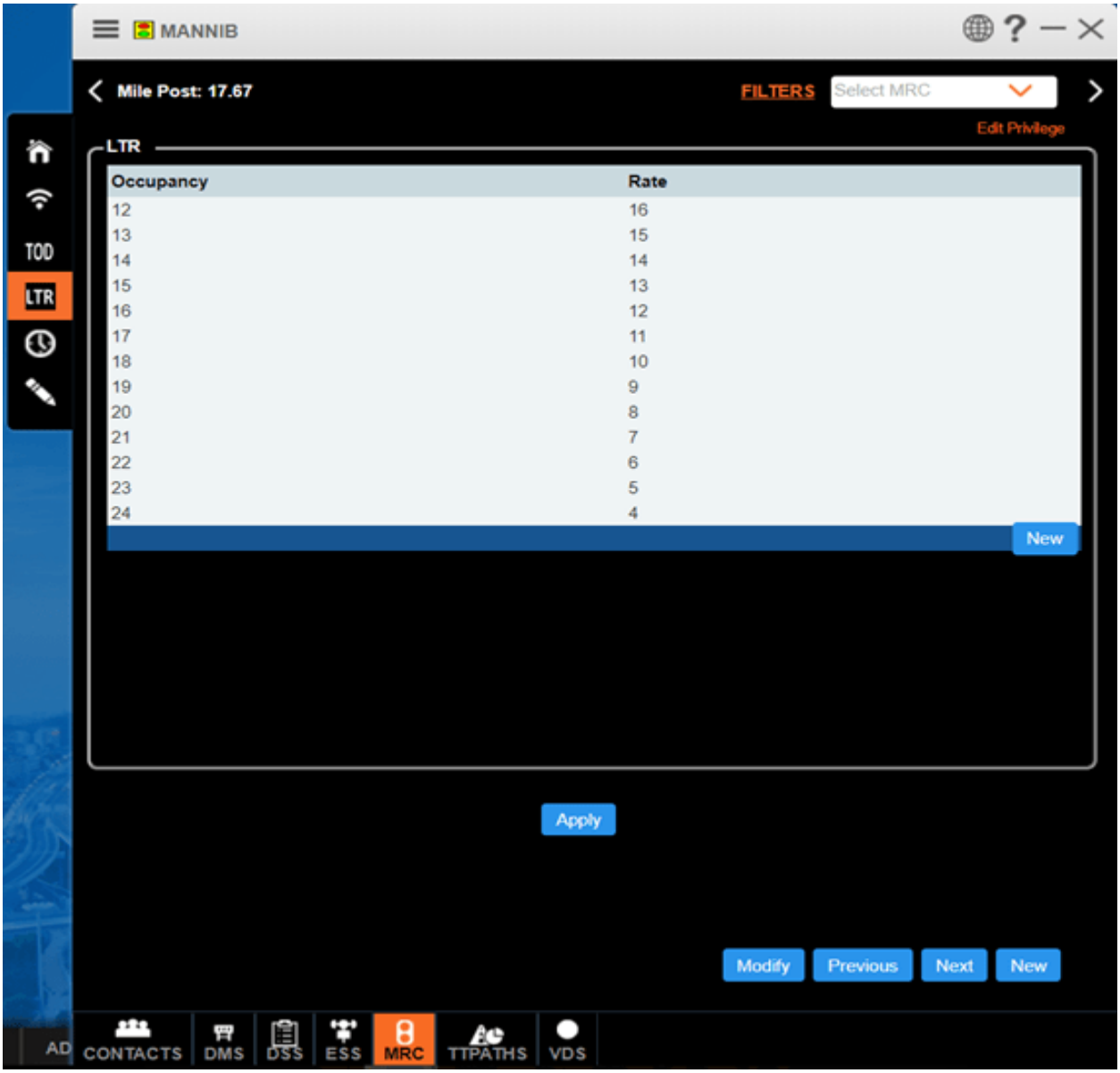
LTR (Local Traffic Response)

The LTR tab is where an MRC looks at volumes on associated VDS (nearby). Based on this and occupancy, can set a specific ramp rate. LTR is discussed in greater detail later in this section.

The LTR tab allows users to Modify Occupancy and Rate as needed or delete chosen selections. To modify values on the LTR tab, highlight the selection you want modified, click modify, and go forward with the appropriate changes. When the user is finished, save changes.

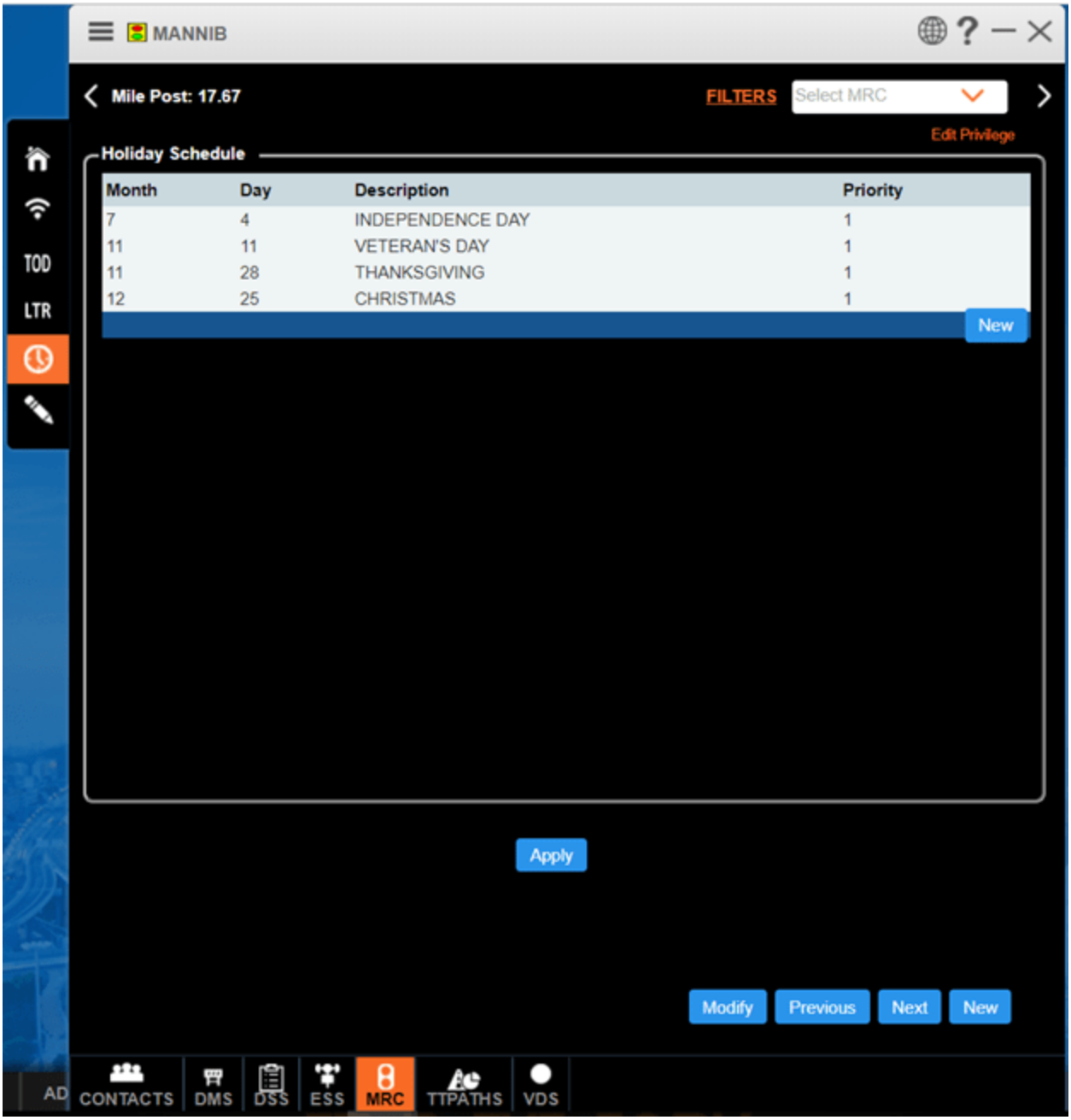
Click on the apply button to verify that parameter changes were successful.

FIGURE: LTR TAB



The holidays tab allows the user to make special MRC provisions for holidays. The image below is an example of a holiday schedule for the MRC on Eisenhower East at Homan Street.

FIGURE: HOLIDAY SCHEDULE TAB



Configuration Tab

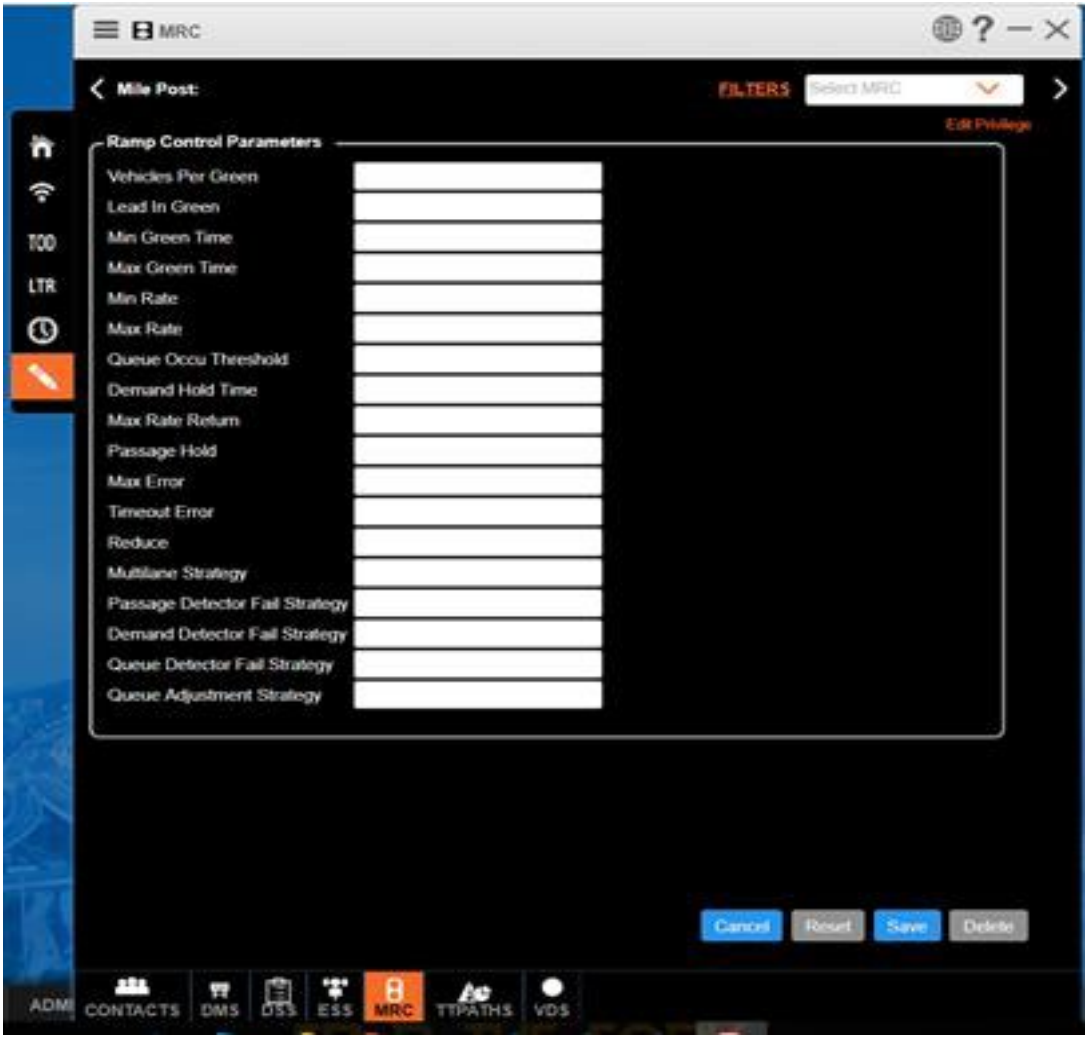
The Metered Ramp Controller is set up through the inventory user interface. The following parameters can be viewed or edited via the configuration tab:

Timing Parameters

Vehicles Per Green
Lead in Green
Minimum Green Time

Maximum Green Time
Minimum Rate
Maximum Rate
Queue Occupancy Threshold
Demand Hold Time
Maximum Rate Return
Passage Hold
Maximum Error
Timeout Error
Reduce
Multilane Strategy
Passage Detector Fail Strategy
Demand Detector Fail Strategy
Queue Detector Fail Strategy
Queue Adjustment Strategy

FIGURE: CONFIGURATION TAB



Setting up Local Traffic Response (LTR)

LTR Operations/LTR Functionality

Local control is defined in the ramps Schedule. The purpose of the LTR algorithm is to provide a capability above the historical Time of Day (TOD) mode that will adapt to traffic conditions local to the entrance ramp. LTR runs relative to active TOD schedules and is not settable to TOD or overarching allowable start/end time for a given day. The LTR for the TSC system has the following functionality:

Conditions on the mainline near the ramp are used to compute metering rates.
LTR can be configured to operate any time or during typical times.
LTR has built-in tunable controls to automatically turn on when required and off when not required.
Minimum rates can be chosen as either local absolute minimum or local TOD. Choosing TOD minimum assures that no rate less than the TOD rate can be chosen.
Full failure management with fall back control. If the local mainline station is providing insufficient data, the mode switches to TOD.
Tunable occupancy thresholds for metering control.
Safeguards to prevent rapid oscillation of rates by smoothing both the mainline occupancies and the computed metering rates.

Ramp Metering Algorithms Details

In addition to the locally determined ramp metering, software options exist that continually monitor a corridor or system to control settings at all locations. One such option, SWARM, seeks to optimize traffic flow on the mainline by being responsive to actual and future forecasted traffic conditions throughout the system and to recurrent and nonrecurrent congestion. SWARM is a proprietary algorithm developed by Contractor.

There are three basic types of SWARM: SWARM 1 operates systemwide to predict congestion, SWARM 2a and SWARM 2b operate locally and are based on headway and storage capacity, respectively.

SWARM 1 is systemwide adaptive and based on a freeway network divided into SWARM sections. Each section begins and ends at a mainline VDS. SWARM 1 algorithm operates at designated and dynamic bottleneck locations and controls vehicle flow of all upstream on-ramp locations linked to that bottleneck.

Because it is directly related to congestion, density is monitored at each bottleneck location. The algorithm requires a nominal saturation density threshold for each mainline VDS in the network. The algorithm attempts to estimate the density in minutes (user settable) in the future based on real-time traffic data. When estimated density exceeds saturation density, ramp meter rates will be computed in an attempt to proactively react to the predicted onset of congestion. Starting at the bottleneck and working upstream, the software calculates new metering rates based on the required volume reductions. Actual metering rates vary between maximum and minimum rates. Because rate adjustments may be positive or negative, excess or reduction values are propagated upstream (user settable).

SWARM 2a is local responsive based on headway (time between consecutive vehicles). It uses the density function to compute local metering rates and attempts to maintain headway such that the maximum flow can be obtained.

SWARM 2b is local responsive based on storage. It computes the number of vehicles stored between two VDS stations and compares it to a maximum storage value. Metering rates are computed to maintain level of service (LOS) D as long as possible.

SWARM can be used in combinations (i.e., SWARM 1 and 2b). The controller uses the more restrictive rates of those recommended. Within a bottleneck segment, some controllers can be programmed to be on local TOD mode while others are programmed to be on one of the SWARM modes. The use of the local TOD mode is especially useful at on-ramps that are experiencing heavy traffic volumes and cannot be further restricted.

Another solution offered is Fuzzy Logic Algorithm (FLA). This method was developed to address specific limitations of the other methods. For example, the data from loop detectors can register as missing or inaccurate because of communication problems, hardware failures, and poor calibration. The other algorithms calculate metering rate adjustments directly from raw loop detector volumes and are limited by the accuracy of the mainline volume data. Additionally, ramp metering has the inherent difficulty of balancing two conflicting objectives: to reduce mainline congestion by decreasing entry rates and to reduce ramp queues by increasing entry rates. As a result, the solution responds to congestion rather than preventing it. Finally, ease of calibration is a difficult undertaking because of variations in the desirable balance between mainline congestion and ramp queue length.

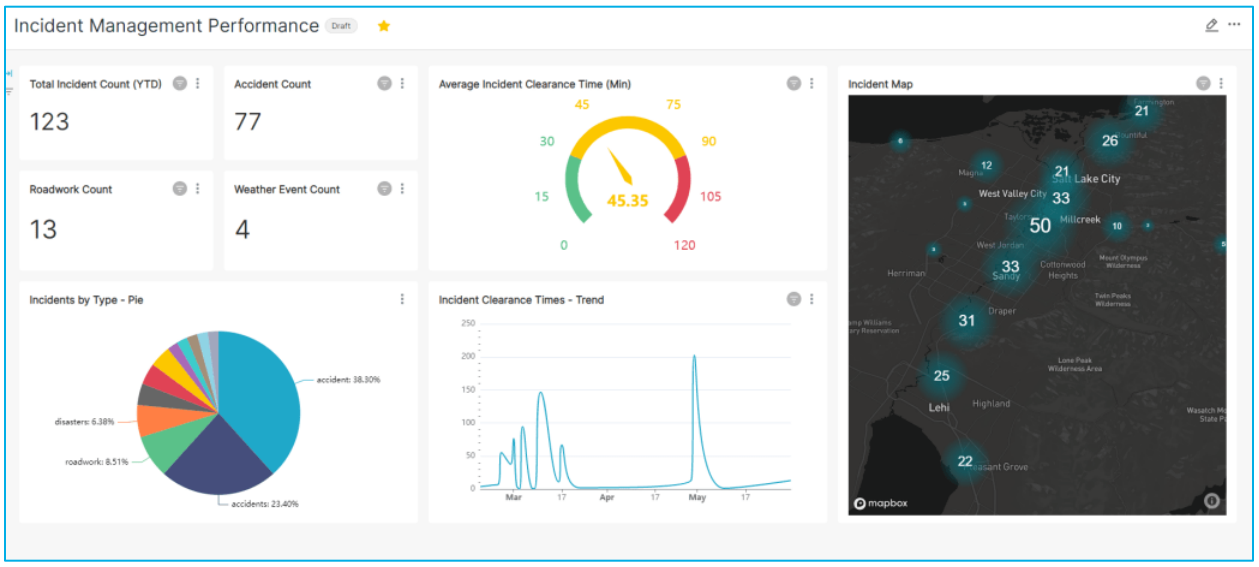
FLA was developed to address the above issues and increase the effectiveness of ramp metering. Fuzzy logic emphasizes qualitative over quantitative information, and inputs and outputs are descriptive (e.g., “no congestion,” “light congestion,” and “medium congestion”), which is appropriate for imprecise or incomplete information. It also uses rule-based logic to incorporate human expertise; in this way, it can balance several performance objectives simultaneously and consider many types of information, such as traffic conditions downstream. These capabilities allow fuzzy logic to anticipate a problem and take action before congestion occurs. FLA is also easier to use. With congestion indicators as inputs, the FLA can handle poor data, incidents, special events, and adverse weather without modifying the control parameters. It also mimics the way that operators approach ramp metering, making it easier to understand and calibrate for desired performance.

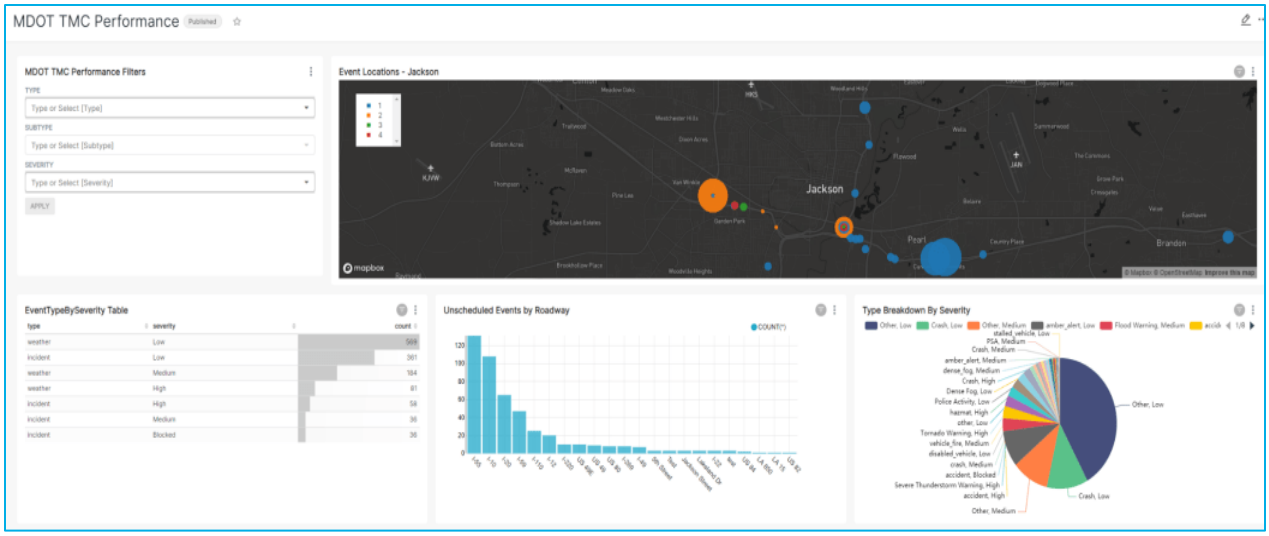
Adaptive Ramp Metering Control controls a set of meters that are assigned to a specified corridor adapting to traffic conditions derived from multiple sets of freeway mainline detectors. The algorithms used in this control of ramp metering have dynamic on/off strategies.

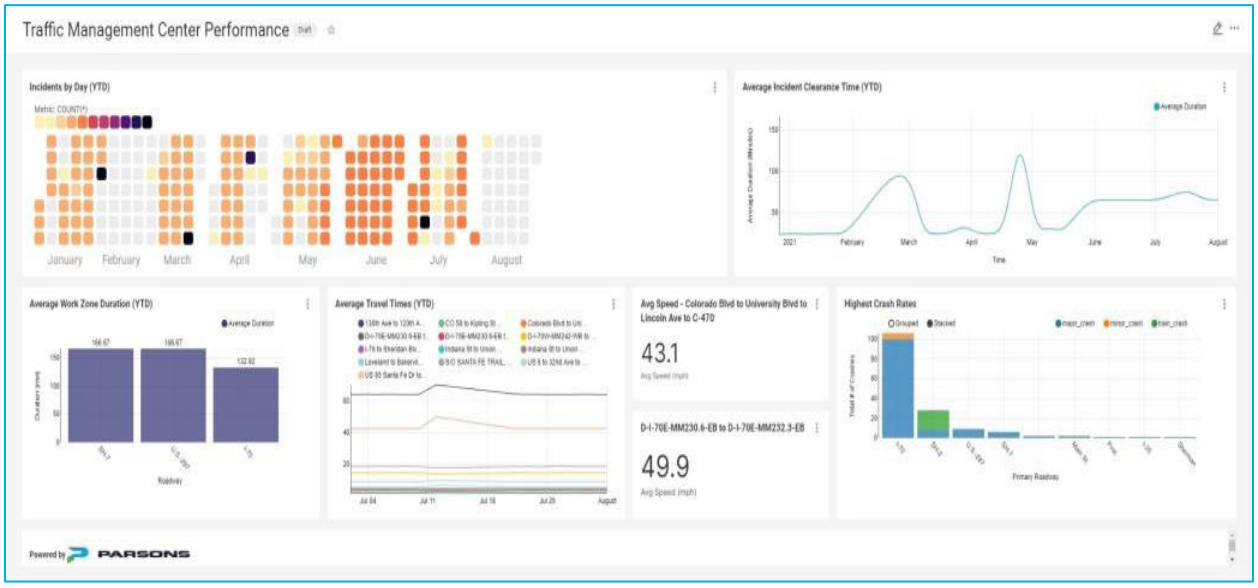
FIGURE: ADVANCED ALGORITHM SETTINGS

Dashboards are a module not in the current Michigan system but they are available as a core module for iNET. Here are some examples of dashboards created for other clients that could be ported for this project:

FIGURE:SAMPLE DASHBOARDS







In addition to these available reports, time can be invested to develop custom dashboards as needed.

This INET deployment will involve a Development environment at the Contractor's location and three environments at the SOM location – Development, QA, and Production.

The software development cycle for a task involves the following phases.

1) Requirements are gathered from the State and documented based on stakeholder input.
2) Design for the task is documented and changes identified.
3) Code development is completed and version controlled in Contractor's environment. Software deployment and testing are also performed on the Contractor's Development server. If external interfaces cannot be accessed in this environment, interface testing will be performed based on simulated input.
4) Software is then deployed on MDOT's Development environment to allow testing with external interfaces and field devices.

5) Once testing is completed, the build can either be provided to MDOT for deployment to QA or, if required access is provided, Contractor can perform the QA deployment.
6) Test plan is provided for testing.
7) Any issues raised are addressed through updates provided.
8) Once the build is vetted on QA, it would be ready for Production deployment.

For the Development environment:

1) Remote write access is required for the Windows application servers to deploy application and troubleshoot.
2) Remote SQL access is needed for the database to create/update tables and functions and to load data.
3) HTTP/HTTPS access is required to access the iNET application through the browser. Any required SSL certificates will need to be provided by the State.

For the QA and Production environment:

1) Remote read access is required for the Windows application servers for troubleshooting. Contractor can also lead the deployment in QA and Production, in which case write access will be needed.
2) Remote SQL access is needed for the database to view data.
3) HTTP/HTTPS access is required to access the iNET application through the browser. Any required SSL certificates will need to be provided by the State.

Desired Access for individual workstations:

1) Screenshare access to view operator action and/or remote access to exercise the ATMS is desirable for troubleshooting purposes.

iNET is licensed with a perpetual license per major module. MDOT has already purchased the iNET perpetual license for all of MDOT's current modules. The only new modules required for new features under this Contract are the Ramp Metering and AVL Modules. A statewide perpetual license for these new modules is listed in Schedule B - Pricing. Once a module is purchased under the statewide license, it is available for any agency within the state to use. Contractor strongly recommends retaining a maintenance license for each module owned by the State. Maintenance licenses allow the Contractor's project team to bring in module updates as needed throughout the life of the project. Maintenance licenses are listed in Schedule B – Pricing. Maintenance licenses are included in ongoing maintenance contracts to support the system.

The following is the list of third-party components used in iNET ATMS:

- JDK
- Dojo Toolkit
- Geoserver
- Wildfly application server
- Openlayers
- Apache libraries
- Commons library
- Rhino libraries
- XMLBeans
- JAXB library
- LOG4J library
- Oracle relational databases
- Hibernate
- JSPELL

- Wowza
- Jasper Reports Services

iNET is a true thin client application. Contractor's latest version is specifically designed to work across a wide range of devices. The system works across Android and Apple platforms on a standard browser, such as the latest Chrome, or Edge. iNET can function on tablets and cell phones. This functionality is available with the base deployment. However, some of the base iNET GUIs can be a bit small on some cell phones.

Contractor can provide a simplified responsive version of iNET specifically designed for smaller mobile devices. The simplified version allows for monitoring and managing events, DMS, and CCTV. In a view that is specifically designed for smaller devices and based on responsive web design to automatically adjust to the device being used. This simplified version requires some additional integration and additional licensing, and would be an additional add-on option.

As a true thin client application, all aspects of the system, with the exception of certain administrative GUIs, can be operated from a mobile device. The tabs across the top are not available, but all other functionality is available. This includes:

- Full map functionality
- All device monitoring and control
- Event management and response plans

As long as the State maintains the maintenance license for any modules used by the State, updates to those modules are included at no additional license costs.

Contractor will provide ongoing system support and maintenance on a cost plus fixed fee or fixed price basis. Contractor has been providing ongoing maintenance support to MDOT for the past 12 years. During that period, all module updates that positively impacted Michigan were provided as Contractor brought in new functionality or features to the modules. Version 11 was a system re-architecture that required some additional costs to bring all the MDOT-specific features into the new architecture.

10. INTEGRATION

Required Integrations

Contractor will integrate their solution to the following technologies. Integration details may change prior to the new ATMS deployment, such as a change in the current provider listed. The frequency of data transfer must be system configurable unless otherwise states in Table 1 – Business Specifications. The data elements being transferred and associated functionality are defined in Table 1 – Business Specification. The State expects API updates to occur and costs for configuring and testing these updates are included in Schedule B – Pricing.

Required ATMS Integrations*					
Integration Title	Inbound / Outbound*	Internal (SOM) vs External System	Existing API	Anticipated Type of Connection	Current Provider
Probe Data**	Inbound	External	Yes	Inrix API	Inrix
Mi Drive	Outbound	Internal	No	API	Internal (SOM)
Weather Feed	Inbound	External	No	API	TerraForm Manager

	Inbound	External	No	API	ESS
Parking and Information Management System (PIMS)	Inbound	External	Yes	API	Truck Specialized Parking Services (TSPS)
	Outbound	External	Yes	API	Trucks Park Here (See Attachment 9 Regional TPIMS Data Exchange v2.2)
Email and Text	Outbound	External	Yes	GovDelivery API	GovDelivery
AVL	Inbound	External	TBD	API	DTN
Social Media	Outbound	External	No	Twitter API	Twitter
Lane Closure and Restriction (LCR)	Inbound	External	No	WZDx	Mixon Hill

*Inbound/Outbound refers to the direction of data flow to/from the ATMS software.
**Contractor must update segment codes twice per year.

The interfaces with outbound data (i.e., from ATMS to another system) will be accomplished using the ATMS API that supports current recognized industry standards (REST and JSON) that will enable all data collected through the ATMS to be shared and ingested by other systems. The ATMS will not limit the number of systems accessing the outbound API.

The State anticipates future enhancements that may update and/or change the above ATMS integrations, including but not limited to changing/transferring the primary source, updating standard protocols, etc. For example, the State is in the process of developing a centralized, application agnostic platform for the continuous exchange of real-time transportation data. The goal of the Real Time Data Exchange (RIDE) project is to replace the current methods for ITS data exchange with a single solution that unifies the State's real time data exchange needs. Therefore, the State anticipates consolidating data feeds identified in the above table to a single solution before, during, and/or after the deployment of the Contractor's ATMS solution. The data elements will remain the same but the primary data source may change. Contractor must include a cost structure that accommodates future enhancements and modifications to the primary source of each data feed. (Pricing provided in Schedule B – Pricing).

Contractor has provided the full list of interfaces and integrated devices that iNET supports.

Contractor has successfully transitioned from using HERE segment data for speeds in MDOT to Inrix. The existing HERE TMC segments were replaced with the Inrix segments, and all existing travel times configurations were updated to point to the Inrix segments. This was done through scripts and configuration changes, and code changes were limited to supporting the new Inrix interface.

Contractor has also transitioned from using the Vaisala feed for Weather data to the Mixon Hill. The existing Vaisala stations were replaced with the Mixon Hill data, and all automated responses pointing to Vaisala stations were updated to point to the Mixon Hill stations.

When the data provider is an existing vendor in which iNET already has an interface, the changes are mostly related to configuration and inventory updates.

Below is a list of third-party interfaces for different modules:

Traffic Data

- HERE
- INRIX
- Wejo (Currently a project-specific custom Integration)
- Bluetoad REST (WS) XML
- MioVision

The traffic data providers above all charge a monthly fee for their data. In some cases, the data from the devices below can come with monthly costs. Contractor does not add any fees for any data interfaces.

- Econolite Autoscope
- EIS RTMS X
- EIS RTMS X3
- EIS RTMS G4
- Intelight 2070 ATC
- ISS/RTMS
- Iteris
- Sensys
- TrafficCast Bluetoad
- TrafficCast Dynaflow 3.0
- Traficon TRafficcam
- Wapiti 170 Traffic Controller
- Wavetronix SS105
- Wavetronix SS125
- Wavetronix SS125/126
- Wavetronix SS105; SS125 U100005329 v10011204 (digital) v000111119 (algorithm); 0000650 (FPGA), A0006302 (FPAA), SS125 vv1.4.3,; SS126 v30014421 (2014/04/21); SS126 v2.1.5
- 3M Microloop
- Citilog
- TPANA REST(WS)/XML

Events

- NWS
- Google Waze
- Waycare
- MTO (Ministry of Transportation of Ontario)
- Multiple CAD systems
- Tiburon
- VDOT VSP (Common Alert Protocol Standard)
- California Highway Patrol
- New World
- New World
- PSSI
- WindyGrid

- Virginia State Police
- Hexagon
- Fat Pots
- GEAC
- GCM
- Windy Grid

Travel Times

- Acyclica
- TPANA
- Iteris

ESS

- Vaisala (SSI)
- High Sierra
- M.H. Corbin (Vaisala)
- NWS
- Lufft
- Vaisala
- Weatherbug
- NWS
- Google Weather (Via Google API)
- Crous Hinds
- Wood Environmental

AVL

- Geotab
- Itrak
- Actsoft
- Perigee
- C-Spire
- Metrolink
- Garmin GPS 18
- BlueTree 5600
- Delcan MDC-004
- IDI MDC 003
- Sierra Wireless GX440
- Morey MC-3
- Orbital Systems OrbCAD

Parking

- Parking Carma
- Sensys
- TSPS

Potential Future Integrations

The following technologies are being considered by the State for potential integration with the Contractor's solution.

Potential Future ATMS Integrations*					
Integration Title	Inbound / Outbound*	Internal (SOM) vs External System	Existing API	Anticipated Type of Connection	Current Provider
CAD	Inbound	External	No	API	Motorola
	Inbound	Internal/External	No	TBD	CLEMIS CAD, Assurion, Tyler Tech's Enterprise, and Nixel
	Inbound	External	No	TBD	Active911
Automated Incident Detection (AID)	Inbound	External	No	TBD	TrafficVision
ITS Asset Management Database	TBD	External	No	TBD	HNTB
Network Management Software	Inbound	External	No	TBD	SolarWinds
Video Wall System	Inbound / Outbound	External	No	TBD	Barco
National Weather Service	Inbound	External	No	TBD	N/A
CV-ATMS	Inbound	External	No	API	N/A
Transportation Performance Measure Reporting and Analysis System (TPMRAS)	In/bound / Outbound	External	No	API	RITIS
Data Analytics Platform	Outbound	TBD	No	API	SOM Business Objects Universe
Safety Service Patrol (SSP)	Inbound	External	Yes	API	IncidentClear

*Inbound/Outbound refers to the direction of data flow to/from the ATMS software.

The potential future integrations are not further defined in Table 1 – Business Specifications since they are not an existing connection to the State's ATMS and the data elements being transferred and associated functionality have not been determined. The below information provides the high-level intent envisioned for these potential future integrations.

General

- The ATMS will provide the ability to automatically generate and populate an event based on an alert from an external interface.
- The ATMS will provide the ability to manage an event created from an external interface in accordance with MDOT's event management practices, such as setting up an auto response.

CAD

- The ATMS will interface (e.g., pull, ingest, and display data) with CAD systems to receive incident alerts and attributes.

AID

- The ATMS will interface with the AID system to receive incident alerts, attributes, nearest CCTV camera, and a log of incidents.

- The ATMS will provide a real-time notification when a roadway incident (stopped/slowed vehicles, wrong way driving events, queue detection, debris, and vulnerable road users, such as pedestrians) is received from the AID system.

ITS Asset Management Database

- The ATMS will interface with MDOT's current and future asset management database (AMD), including but not limited to, work order status and device inventory.
- The ATMS will provide the ability to populate a trouble ticket with relevant and available information, including device type and location.

Network Management Software

- The ATMS will interface with MDOT's current and future network management software (NMS) in ingest information such as network performance, health, status, and configurations.

Video Wall System

- The ATMS will interface with multiple third-party video wall systems to configure layouts and add/remove video sources.

iNET ATMS will integrate with the following video wall systems:

- Activu
- Jupiter
- PixelNet, Control Point
- BARCO Apollo
- BARCO OpenCMS
- Christie Nodes
- Electrosonic VN Quantum
- Barco Transform A
- Barco Transform N
- Jupiter Control Point
- Jupiter Fusion
- Datapath Iolite 12i Controller
- Vicon Analog Video Only
- Pelco Analog Video Only

iNET ATMS does include its own optional video wall system. It contains the following capabilities:

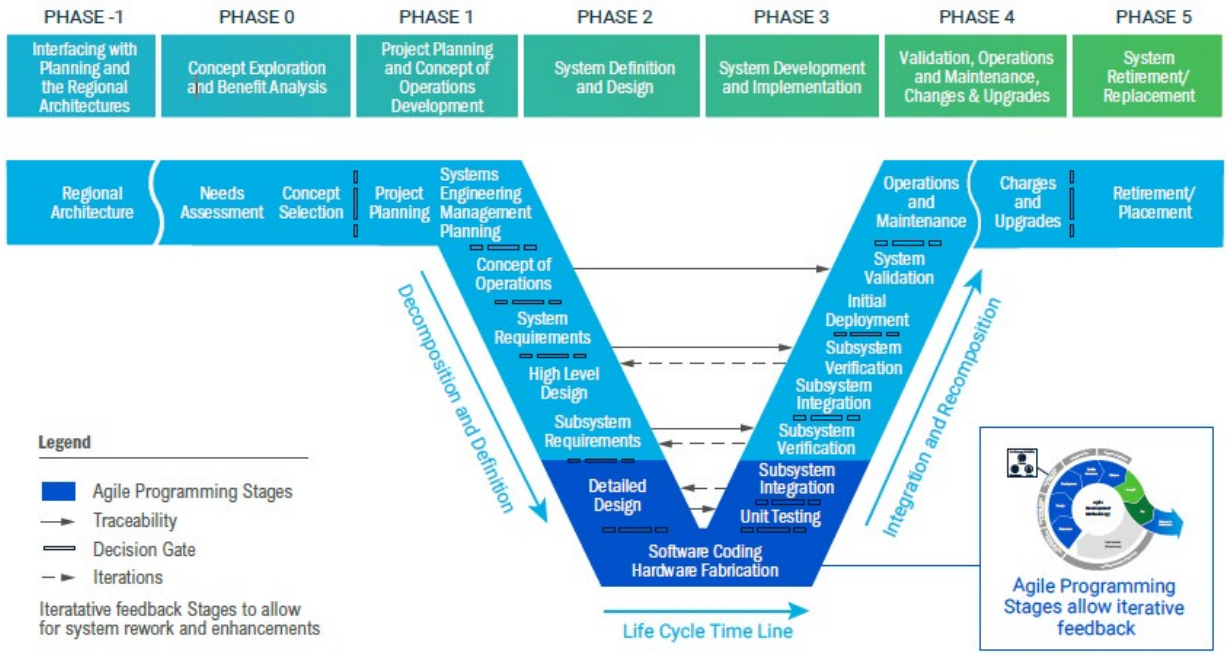
- Software-based video decoder that does not have any unique hardware requirements
    - Requires a PC or server that supports a Windows 64-bit operating system.
    - Can support multi-display configurations but is dependent on the video wall PC/server that is used and its physical display connections.
    - Number of concurrent video streams is only limited by the hardware resources of the video wall PC/server that is used and any limitations of the network connections
- Video wall application supports defining any number of advanced layouts. Includes a UI for creating/ editing video wall layouts.
- Video wall application capable of decoding MPEG-4, H.264, and H.265 streaming video. Supports both unicast and multicast video.
- The iNET ATMS includes an interface to the Contractor's video wall application and leverages the same ATMS video wall UI that is used for other standard video wall integrations such as Activu/Barco/Jupiter. This interface includes the following functionality:
    - Provide a list of available layouts to activate.
    - Ability to activate or deactivate layouts.
    - Rendering of the currently active layout, including information about each window's current content.

  - Ability to drag and drop cameras from the ATMS into a window within the active layout.
  - Supports running a video tour per video window.
- There is no limit on the number of video wall applications or video wall PCs/servers that may be used.

Any integrations beyond the original scope will be defined at MDOT's request, and a level of effort and Statement of Work will be provided. The key process will be to organize stakeholders and identify the potential sources for integration and then how the information should be presented or utilized.

Contractor will use an enhanced version of the DOT-approved Vee systems engineering process for the planning, design, development, testing, and verification of this next-generation MDOT ATMS deployment. The enhanced version of this process introduces Agile development methodologies and is currently supported by the DOT and FHWA Resource Center for its advantages to allow dynamic changes, improved quality, reduced risk, and early and predictable delivery. The enhanced process is depicted in the Vee diagram shown in the figure below.

FIGURE: SYSTEM ENGINEERING MODEL



National Weather Service

- The ATMS will have the ability to pull, ingest and display data from the National Weather Service (NWS).

CV-ATMS

- The ATMS will interface with MDOT's current and future third-party hosted CV-ATMS system for connected vehicle infrastructure management, operations, and data storage/evaluation.

TPMRAS

- The ATMS will ingest data from a Transportation Performance Measure Reporting and Analysis System (TPMRAS) which would be provided through a separate MDOT contract.
- The ATMS will provide the ability to access and query event and device data collected by TPMRAS.

Travel Time Systems

- The ATMS will have the ability to pull, ingest, and display data (e.g., volume, class, speed, occupancy, origin/destination, headway, and gap time) from a travel time system.

Safety Service Patrol

- The ATMS will have the ability to pull, ingest, and display assist information and attributes from a SSP system.

TABLE: POTENTIAL FUTURE ATMS INTEGRATIONS

Integration Title	Inbound / Outbound*	Current Provider	
CAD	Inbound	Motorola	iNET is specifically designed to support the integration of external CAD events. Contractor has many CAD–ATMS Interfaces. Contractor can easily support standards-based and CAD vendor-specific interfaces. Contractor has not interfaced with these CAD vendor systems, Contractor can quickly deploy CAD interfaces. iNET can access their events through APIs or access to database views.
	Inbound	CLEMIS CAD, Assurion, Tyler Tech's Enterprise, and Nixel	
	Inbound	Active911	
Automated Incident Detection (AID)	Inbound	TrafficVision	iNET can provide AID directly through the AID module or bring in AID through other vendors, such as Citilog or TrafficVision.
ITS Asset Management Database	TBD	HNTB	Contractor has built two-way interfaces to multiple asset management systems. While Contractor has not interfaced to the HNTB asset management system, this will require limited effort from Contractor.
Network Management Software	Inbound	SolarWinds	Contractor has created interfaces with similar Network monitoring tool such as Zabbix and Nagios. There will be no issues to build a new ATMS interface with Solarwinds.
Video Wall System	Inbound / Outbound	Barco	iNET has interfaced with multiple Barco Video versions. As a result, this will require limited effort from Contractor.
National Weather Service	Inbound	N/A	MDOT's iNET deployment already has the ability to bring in live NWS weather layers. Contractor has pulled in NWS data in other iNET deployments and can bring this over to MDOT's deployment.
CV-ATMS	Inbound	N/A	The MDOT iNET deployment already has the ability to interface with Dedicated Short-Range Communication (DRSC) units to provide Truck Parking information. Contractor also interfaces with CV data in California's I-80 project and Illinois Tollway. Contractor is deploying

			Connected Vehicle to X (CV2X) equipment for Chicago DOT that will be integrated back to the ATMS
Transportation Performance Measure Reporting and Analysis System (TPMRAS)	Inbound / Outbound	RITIS	MDOT's current iNET deployment already has an interface that allows information to be provided to the Regional Integrated Transportation Information System (RITIS).
Data Analytics Platform	Outbound	SOM Business Objects Universe	The current MDOT iNET deployment already provides the data for more than 60 SOM Business Objects Universe Reports
Safety Service Patrol (SSP)	Inbound	External	INET™ is designed to support SSP dispatch and management. It is used directly for SSP dispatch in Hawaii. Contractor also brings in events from external SSP systems in other iNET deployments

*Inbound/Outbound refers to the direction of data flow to/from the ATMS software.

11. MIGRATION

The migration of various operational data will be part of the transition of solutions to support daily operations. The migration of data may be transferred, uploaded, or manually inputted. The data migrated will need to support operations immediately following the acceptance of the software's initial phase (i.e. day one of operations). The data may or may not be stored in the current ATMS and may need to be created based on input from MDOT, at the State's discretion. Operations is dependent on the ability of the Solution to integrate and/or coordinate with other systems. The table below identifies data the State has determined, at a minimum, to be migrated to the new system. The migration of data will support the transition of the software, as defined in Schedule G – Transition In and Out.

Current ATMS Data to be Migrated to the New System
Device Lat/Lon, asset number, IP connection information (e.g., IP address, port number), jurisdiction/region, protocol connection information
CCTV tours, presets
Response plans
DMS Message Library (device specific and/or general messages, graphics library)
Users account information and roles/permissions
Contact matrix
Pre-defined business rules and/or attributes (required fields, lists, event types, SSP dispatch parameters, etc. as defined per system)
Data exchange protocols
Operator shift information
Event parameters (incident timeline information)

MDOT is currently using the iNET ATMS. In compliance with the requirements in the Contract, Contractor will provide all the required additional features, enhancements, and updates to the existing ATMS system, eliminating any transition risks and costs.

When determining storage size and creating specifications for database servers, Contractor always considers the potential future data growth, ensuring there is enough space left for it. Additionally, database servers can be easily scaled up in storage space if required to accommodate any further data growth without affecting application functionality or performance. In the future, if the State decides to move away from the on-premise model and store all data in the cloud, the iNET system can be configured to support that as well.

iNET is a highly scalable system with no performance impact as it is scaled up or down. The software is designed to keep data access transactions very lean, processing threads asynchronous and short, with effective caching mechanism and using tuned and optimized queries at the back end. These are design factors allowing the system to scale and perform well. The iNET Application server comes with a set of built in APIs and libraries that supports system flexibility and scalability. iNET system also has the capability to be scaled horizontally through clustering and load balancing as well as vertically by adding more hardware resources such as CPU and Memory. The system can also be scaled down without impact to system functionality or performance.

MDOT is currently using the Contractor's iNET ATMS. This will save the State significant financial resources and eliminate any risks associated with a large scale data migration. These cost savings can be used by the State to support other system enhancements to support operational needs.

The database may be increased at the time of transition, if required by the State.

12. TRAINING SERVICES

The Contractor must provide administration and end-user training for implementation, go-live support, and transition to customer self-sufficiency.

The State is open to both classroom or online training for end users, administrator, or other types. The anticipated number of end users requiring training is 200, administrator is two, and approximately 10 for other types of training (system support).

The format can be modified based on specific needs, but the high-level goal will be to do web-based training for the largest group to demonstrate high-level functionality. For new features, a large group training is performed and recorded to allow a broad overview in conjunction with a user manual and a test plan. The training is then repeated in greater detail at region-specific trainings in person, and finally with a train-the-trainer workshop in person, allowing managers and super users a hands-on tutorial and in-depth learning session. For follow up, lunch-and-learn sessions are offered to refresh or touch on specific scenarios.

The duration of each will be based on need. Operators lose focus if web-based sessions extend past 3 hours, so there would one or multiple 3-hour sessions per training. The in-person training will be 4 to 8 hours each, with half the time allotted for demonstration and training and the other half for hands-on user interaction with the trainer available to answer questions and guide through the workflow.

Go-live support will be up to a week for the initial major builds and for subsequent builds 1 to 2 days.

The user manual is always available to all users through the Help module within the ATMS. Outside of the user manual that is updated with each release, Contractor includes a test plan for explaining the new functions and a step-by-step procedure to allow the users to learn the new feature while also testing it against their usual standard operating procedures.

Initial Trainings. Contractor must provide initial trainings, during the first 12 months of the contract, which consist of one 4-hour trainings every 30 calendar days for up to 40 users at each session which is to be held virtually or at a State facility. These trainings will cover all aspects and functions of the system. These can be refresher courses on existing ATMS functionality in virtual short settings. These can also be used to introduce upcoming modules and enhancements in a lecture format before they are available in QA, which will reduce shock and rush to the operators later.

Basic Training. Contractor must provide a basic training course, to be conducted annually or upon request, which includes at least one 4-hour day of basic training for up to 100 users to be held virtually or at a State facility. These trainings are intended for new users with little to no familiarization of the system and may, at the discretion of the State, be recorded for future use or replay. This will be done while the updates are in the QA environment. Basic training is a combination of presenting to the users and allowing them hands-on time while an instructor is available to walk through any questions. These can also be done additionally for new users in the future, independent of a software build.

Advanced Training. Contractor must provide an advanced training course, to be conducted annually or upon request, which includes at least one 8-hour day of advanced training for up to 50 users to be held virtually or at a State facility. These trainings are intended for current users with daily familiarization of the system and may, at the discretion of the State, be recorded for future use or replay. This will be done after new builds and on request. Advanced trainings will be geared toward high-level users and admin types, digging deep not only into what can be done but also walking through configurations and set up for system optimization. Users in these trainings will benefit from a “train the trainer” format.

New Software Build Training. Contractor must provide a new software build training course, to be conducted within 30 calendar days of each major software enhancement and/or build, which includes at least one 4-hour day of new software/major software enhancement training for up to 40 users to be help virtual or at a State facility. These trainings must cover all aspects and functions of the software system enhancement and/or build. This is incorporated with the basic and advanced training above, but to reiterate, there will be trainings associated with each build. An initial introduction may be virtual, but it will be followed by more in-depth training at the centers coinciding with go-live. The training will ensure users are comfortable with the system, and the trainer will be available to walk through any scenarios or questions the users have.

13. TRANSITION RESPONSIBILITIES

Transition-In Plan
There is no formal Transition-In plan as the Contractor is the incumbent. Standard procedures will be followed for any new builds that contain enhancements or new functionality.

Transition-Out Plan
If iNET ATMS is not retained, Contractor will work closely with MDOT/DTMB and the incoming solution provider for a smooth transition. Throughout the transition period, Contractor will continue to provide support for the current iNET ATMS until it is taken offline. Contractor will assist with database queries, commands, or any technical issues related to iNET database, configurations, and data migration. If iNET needs to be restored temporarily due to unanticipated transition glitch, Contractor will provide direct or indirect support to expeditiously bring iNET online until the situation is resolved. At the end of the transition period, and upon transition approval, the new ATMS solution provider will assume full responsibility for all ATMS tasks and deliverables.

14. DOCUMENTATION

Contractor must provide all user manuals, operating manuals, technical manuals and any other instructions, specifications, documents or materials that describe the functionality, installation, testing, operation, use, maintenance, support, technical or other components, features or requirements of the Software.

Contractor must develop and submit for State approval complete, accurate, and timely Solution documentation to support all users, and will update any discrepancies, or errors through the life of the contract.

The Contractor’s user documentation must provide detailed information about all software features and functionality, enabling the State to resolve common questions and issues prior to initiating formal support requests.

An excerpt of the User Manual is included above in response to Section 9 - Software. The user manual is always available to all users through the Help module within the ATMS. Outside of the user manual that is updated with each

release, Contractor will include a test plan for explaining the new functions and a step-by-step procedure to allow the users to learn the new feature while also testing it against their usual standard operating procedures.

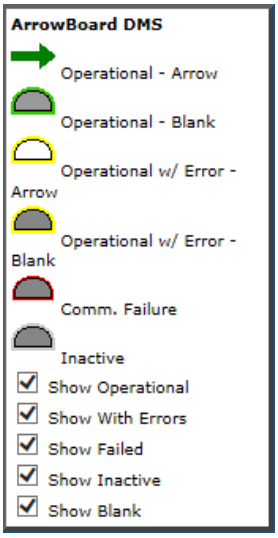
Here is an additional excerpt from the current user manual.

The ArrowBoard DMS Viewer Window

An ArrowBoard DMS Viewer window can be opened by clicking the ArrowBoard images from the DMS List window (Refer to Figure 115). To define ArrowBoard signs, give the description “arrow board” for that device in the DMS Inventory window. There are several ways to view ArrowBoard sign details in the Viewer window:

- Drag and drop an Arrow icon from the Map window to the Viewer window
- Drag and drop an Arrow icon from the List window to the Viewer window
- Click on the Arrow icon from the Map window
- Click on the drop-down box located at the top of the Viewer window and choose from the list provided

FIGURE: ARROWBOARD DMS



Adding ArrowBoard DMS Locations

A permitted user can add new ArrowBoard DMS to the database using the Inventory window.

To open a blank entry form for arrow DMS, open an Inventory window and click DMS in the switcher bar. If the user has been given the privilege to add new inventory, a blank inventory entry form will open.

If the user does not have the correct privilege, the Inventory window will display the first record of the selected type from the database.

On the Inventory entry form, fill in all required data **and description will be added as ArrowBoard to define ArrowBoard signs** and click the Save button to add the new equipment record to the database. Once a DMS is saved, it will become immediately available for other subsystems to use in the system. The ATMS will notify the user if a problem occurs while adding the new inventory. Once the location is saved, the Geolocator map will show a view of the system map that is zoomed in to the location.

15. ADDITIONAL PRODUCTS AND SERVICES

iNET ATMS is already fully functional in the State’s environment. Contractor will provide new Dashboards within the ATMS UI displaying real-time data and traffic network performance, such as average speeds, stopped/slow traffic, and number of incidents. No other new products or services will be required to continue operations of the ATMS in the State’s environment.

16. CONTRACTOR PERSONNEL

Contractor Contract Administrator. Contractor resource who is responsible to(a) administer the terms of this Contract, and (b) approve and execute any Change Notices under this Contract.

Contractor
Name: Joseph Brahm **Address:** 650 E. Algonquin Road, Suite 400 Schaumburg, IL 60173 **Phone:** 1-262-391-8056 **Email:** Joseph.Brahm@parsons.com

Classification	Skill Set	Years of Experience
ATMS Deployment (Integration/Transition) Lead	*5 years of experience managing the transition and integration for similar size and scope of this solicitation.* *Excellent communication and organization skills required* *Ability to motivate and guide staff to ensure secure, accurate, efficient, and timely delivery of service*	***5 years***
ATMS Enhancement Lead	*5 years of experience managing the transition and integration for similar size and scope of this solicitation.* *Excellent communication and organization skills required* *Ability to motivate and guide staff to ensure secure, accurate, efficient, and timely delivery of service*	***5 years***
ATMS Maintenance/Support Lead	*5 years of experience managing the transition and integration for similar size and scope of this solicitation.* *Excellent communication and organization skills required* *Ability to motivate and guide staff to ensure secure, accurate, efficient, and timely delivery of service*	***5 years***
ATMS Training Lead	*5 years of experience managing the transition and integration for similar size and scope of this solicitation.* *Excellent communication and organization skills required* *Ability to motivate and guide staff to ensure secure, accurate, efficient, and timely delivery of service*	***5 years***

17. CONTRACTOR KEY PERSONNEL

Contractor Project Manager. Contractor resource who is responsible to serve as the primary contact with regard to services who will have the authority to act on behalf of the Contractor in matters pertaining to the implementation services, matters pertaining to the receipt and processing of Support Requests and the Support Services.

Contractor
Name: Joseph Brahm **Address:** 650 E. Algonquin Road, Suite 400 Schaumburg, IL 60173 **Phone:** 1-262-391-8056 **Email:** Joseph.Brahm@parsons.com

Contractor Security Officer. Contractor resource who is responsible to respond to State inquiries regarding the security of the Contractor's Solution. This person must have sufficient knowledge of the security of the Contractor Solution and the authority to act on behalf of Contractor in matters pertaining thereto.

Contractor
Name: Adam Chandler **Address:** 2201 Dupont Drive, Suite 200 Irvine, California 92612 **Phone:** 714-581-3771 **Email:** Adam.Chandler@parsons.com

18. CONTRACTOR PERSONNEL REQUIREMENTS

Background Checks. Contractor must present certifications evidencing satisfactory Michigan State Police Background checks, ICHAT, and drug tests for all staff identified for assignment to this project.

In addition, proposed Contractor personnel will be required to complete and submit an RI-8 Fingerprint Card for the National Crime Information Center (NCIC) Finger Prints, if required by project.

Contractor will pay for all costs associated with ensuring their staff meets all requirements.

Offshore Resources.

Contractor will not use any offshore resources to support this project. The bulk of the staff that will be used are based out of Contractor's Schaumburg, Illinois, office, with support from the local Michigan office in the Detroit metro area (Troy) and some staff from other offices within the United States.

19. STATE RESOURCES/RESPONSIBILITIES

The State will provide the following resources as part of the implementation and ongoing support of the Solution.

State Contract Administrator. The State Contract Administrator is the individual appointed by the State to (a) administer the terms of this Contract, and (b) approve and execute any Change Notices under this Contract.

State Contract Administrator
Name: Christopher Martin **Phone:** 517-643-2833 **Email:** martinc20@michigan.gov

Program Managers. The DTMB and Agency Program Managers (or designee) will jointly approve all Deliverables and day to day activities.

DTMB Program Manager
Name: Dave Work **Phone:** 517-719-2250 **Email:** workd@michigan.gov

Agency Program Manager
Name: Joe McAttee **Phone:** 517-636-6058 **Email:** mcatteej@michigan.gov

20. MEETINGS

At start of the engagement, the Contractor Project Manager must facilitate a project kick off meeting with the support from the State's Project Manager and the identified State resources to review the approach to accomplishing the project, schedule tasks and identify related timing, and identify any risks or issues related to the planned approach. From project kick-off until final acceptance and go-live, Contractor Project Manager must facilitate weekly meetings (or more if determined necessary by the parties) to provide updates on implementation progress. Following go-live, Contractor must facilitate monthly meetings (or more or less if determined necessary by the parties) to ensure ongoing support success.

The Contractor must attend the following meetings, at a location and time as identified by the state, at no additional cost to the State:

- Bi-Weekly ATMS Stakeholder Meetings (and any sub-teams from the ATMS stakeholder group)
- Weekly Status Meeting for duration of deployment process
- Requirement Validation Meetings
- Third-party integration meetings

Contractor will facilitate at least the above-mentioned meeting cadence. A weekly stand up on Monday morning keeps schedules in check and contributes to project success. The monthly meeting will be a place for all stakeholders to be kept in the loop, but it will not be a place for workshops or technical discussion. On top of the weekly meetings, smaller technical groups will be created to address workshop-level questions and involve technical parties. These smaller groups will also address third-party integration details. The larger status meeting will define which direction to take on integrations, but the technical team will architect the solution separately.

As the project moves past go-live, every other week meetings are suggested.

In addition to these regular meetings, a one-time requirements workshop will be held. This will be a 3- to 5-day workshop to go through every requirement and clearly define expectations on all sides, as well as provide decomposition of any requirements that may be open ended.

Some additional small technical work groups will be needed to dive deeper into specific issues.

Contractor will always facilitate enough meetings to keep all the stakeholders informed and involved. Contractor will notify the State's Project Manager if any meeting cadence or group is no longer productive. Working together, these meetings will be scheduled bi-monthly or monthly as needed, and once a technical group has accomplished all goals, the standing meetings will be disbanded.

All meetings will be documented. Meeting notes will be posted on the project's SharePoint site and will be available to all team members for review and comment.

21. PROJECT CONTROL & REPORTS

Once the Project Kick-Off meeting has occurred, the Contractor Project Manager will monitor project implementation progress and report on a weekly basis to the State's Project Manager the following:

- Progress to complete milestones, comparing forecasted completion dates to planned and actual completion dates
- Accomplishments during the reporting period, what was worked on and what was completed during the current reporting period
- Indicate the number of hours expended during the past week, and the cumulative total to date for the project. Also, state whether the remaining hours are sufficient to complete the project
- Tasks planned for the next reporting period
- Identify any existing issues which are impacting the project and the steps being taken to address those issues
- Identify any new risks and describe progress in mitigating high impact/high probability risks previously identified

- Indicate the amount of funds expended during the current reporting period, and the cumulative total to date for the project.

iNET ATMS contrains 60 current reports will remain available without additional effort from MDOT or DTMB. Any effort put toward reports will add to the current functionality. The latest version of iNET, offers a set of system dashboards that will support MDOT's real-time operations. Samples of these dashboards are shown below.

The design, development, implementation, and testing of reports will occur for 1 year beyond transition to finalize the reporting package. The purpose of this is to engage Contractor in accommodating additional State reporting needs that become apparent subsequent to the actual deployment of the ATMS.

For ATMS reporting, the Contractor must present a comprehensive set of report formats that demonstrate how their reporting package allows for full auditability as well as efficient and complete program operational and statistical reporting at the lane, roadway, TOC, system, and back office levels. The Contractor must coordinate with the State on all development of reports within the system to ensure both the reports meet the needs of the users and the data is available within the reports.

The State has approximately 60 reports produced regularly based on data within the ATMS and used to support performance-based decisions at each TOC. These reports will be based on operational and performance data analytic logic for multiple systems in multiple formats presented to various stakeholders. The following report examples are provided in Attachment 10: Project Performance Report (SEMTOC); STOC Annual Report, SEMTOC Quarterly Report, STOC Operations Report, and WMTOC Monthly Performance Report.

It is anticipated the design, development, implementation, and testing of reports will occur for one year beyond transition to finalize the reporting package. The purpose of this is to engage the Contractor in accommodating additional State reporting needs that become apparent subsequent to the actual deployment of the ATMS.

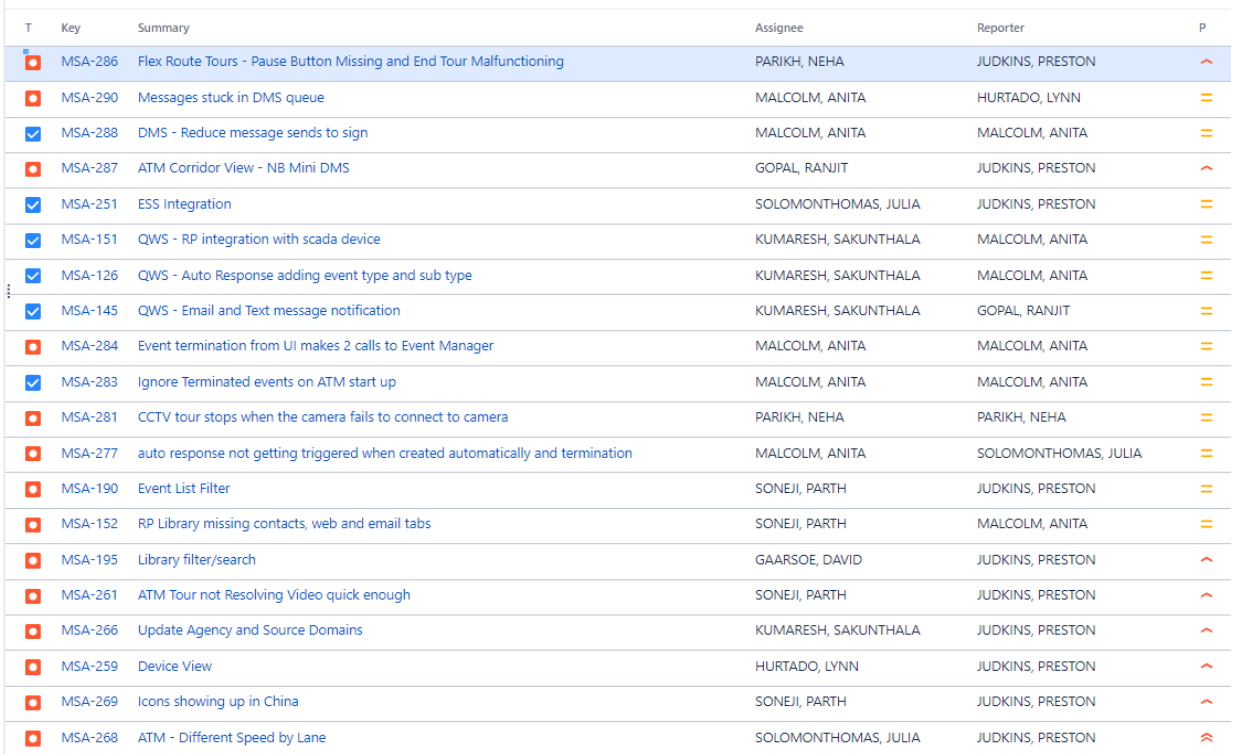
Contractor's accounting systems track all costs associated with a project. Contractor's accounting system provides this data to the Common Forecasting Tool (CFT). Through the CFT, Contractor's Project Managers enter additional details such as percent complete by WBS. The CFT tracks project parameters such as earned value, estimate to complete gap, forecast estimate at complete, and estimates to complete. Contractor's Project Managers are required to review and update the CFT monthly. This ensures Project Managers stay on top of project status and are aware of any issues right away, as they arise.

FIGURE: SAMPLE CFT OUTPUT

WBS	Description	WBS Status	Budget	ETC Gap	Forecast/EAC	Actuals to Date	Estimate to Complete	EAC Variance to Budget	Physical % Complete	Cost % Complete	Forecast/EAC EV	Forecast/EAC CPI	Budget EV	Budget CPI
00320	Z2C 20 VALIDATION OF REQUIREMENTS	Closed	13,962	-	5,848	5,848	-	8,114	100.00%	100.00%	5,848	1.00	13,962	2.39

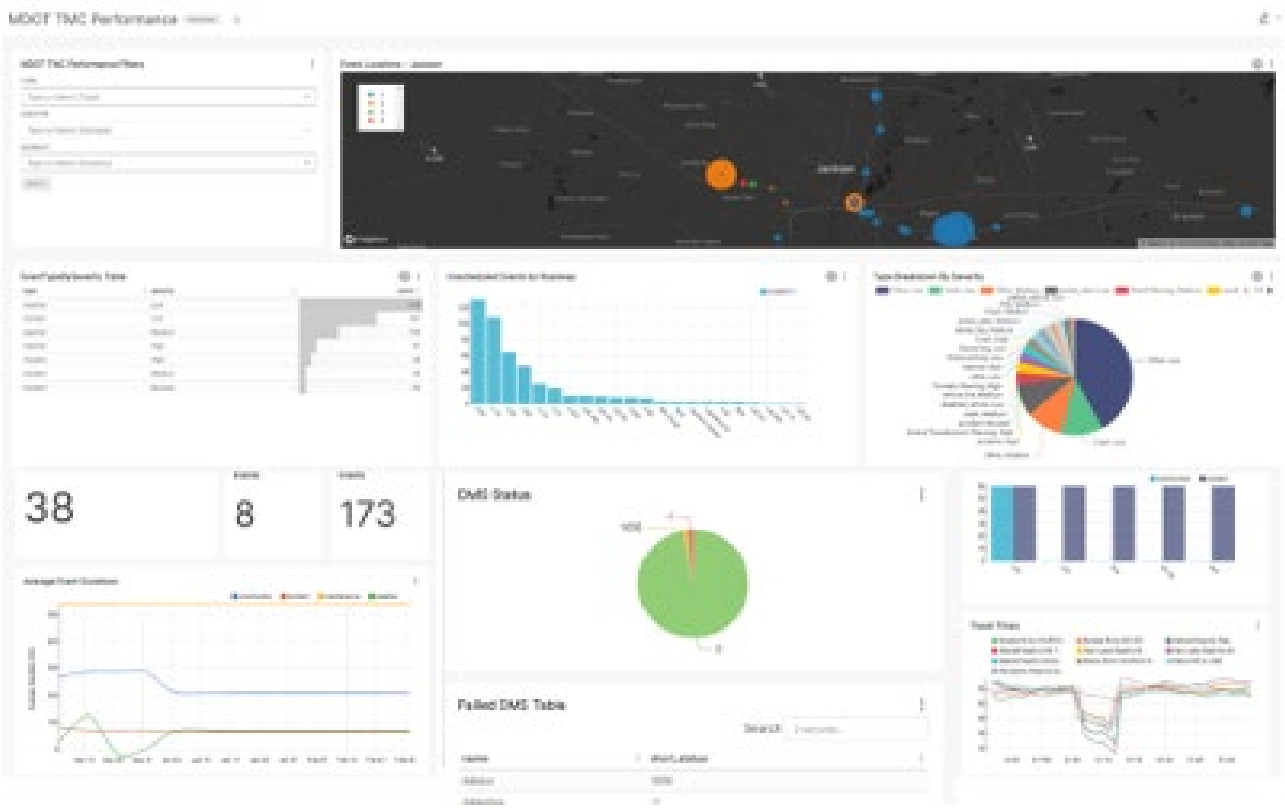
In addition, Contractor uses Jira to track all project software activity by tasks. Through Jira, all software tasks are tracked, assigned, and tracked from conception, through to testing and deployment. Through Jira, Contractor's Project Managers can quickly see the status of all tasks and appropriate notes associated with each task.

FIGURE: SAMPLE JIRA SCREENSHOT



T	Key	Summary	Assignee	Reporter	P
	MSA-286	Flex Route Tours - Pause Button Missing and End Tour Malfunctioning	PARIKH, NEHA	JUDKINS, PRESTON	
	MSA-290	Messages stuck in DMS queue	MALCOLM, ANITA	HURTADO, LYNN	
	MSA-288	DMS - Reduce message sends to sign	MALCOLM, ANITA	MALCOLM, ANITA	
	MSA-287	ATM Corridor View - NB Mini DMS	GOPAL, RANJIT	JUDKINS, PRESTON	
	MSA-251	ESS Integration	SOLOMONTHOMAS, JULIA	JUDKINS, PRESTON	
	MSA-151	QWS - RP integration with scada device	KUMARESH, SAKUNTHALA	MALCOLM, ANITA	
	MSA-126	QWS - Auto Response adding event type and sub type	KUMARESH, SAKUNTHALA	MALCOLM, ANITA	
	MSA-145	QWS - Email and Text message notification	KUMARESH, SAKUNTHALA	GOPAL, RANJIT	
	MSA-284	Event termination from UI makes 2 calls to Event Manager	MALCOLM, ANITA	MALCOLM, ANITA	
	MSA-283	Ignore Terminated events on ATM start up	MALCOLM, ANITA	MALCOLM, ANITA	
	MSA-281	CCTV tour stops when the camera fails to connect to camera	PARIKH, NEHA	PARIKH, NEHA	
	MSA-277	auto response not getting triggered when created automatically and termination	MALCOLM, ANITA	SOLOMONTHOMAS, JULIA	
	MSA-190	Event List Filter	SONEJI, PARTH	JUDKINS, PRESTON	
	MSA-152	RP Library missing contacts, web and email tabs	SONEJI, PARTH	MALCOLM, ANITA	
	MSA-195	Library filter/search	GAARSOE, DAVID	JUDKINS, PRESTON	
	MSA-261	ATM Tour not Resolving Video quick enough	SONEJI, PARTH	JUDKINS, PRESTON	
	MSA-266	Update Agency and Source Domains	KUMARESH, SAKUNTHALA	JUDKINS, PRESTON	
	MSA-259	Device View	HURTADO, LYNN	JUDKINS, PRESTON	
	MSA-269	Icons showing up in China	SONEJI, PARTH	JUDKINS, PRESTON	
	MSA-268	ATM - Different Speed by Lane	SOLOMONTHOMAS, JULIA	JUDKINS, PRESTON	

FIGURE: DASHBOARDS



22. PROJECT MANAGEMENT

The Contractor Project Manager will be responsible for maintaining a project schedule (or approved alternative) identifying tasks, durations, forecasted dates and resources – both Contractor and State - required to meet the timeframes as agreed to by both parties.

Changes to scope, schedule or cost must be addressed through a formal change request process with the State and the Contractor to ensure understanding, agreement and approval of authorized parties to the change and clearly identify the impact to the overall project.

SUITE Documentation
In managing its obligation to meet the above milestones and deliverables, the Contractor is required to utilize the applicable State Unified Information Technology Environment (SUITE) methodologies, or an equivalent methodology proposed by the Contractor.

SUITE's primary goal is the delivery of on-time, on-budget, quality systems that meet customer expectations. SUITE is based on industry best practices, including those identified in the Project Management Institute's PMBoK and the Capability Maturity Model Integration for Development. It was designed and implemented to standardize methodologies, processes, procedures, training, and tools for project management and systems development lifecycle management. It offers guidance for efficient, effective improvement across multiple process disciplines in the organization, improvements to best practices incorporated from earlier models, and a common, integrated vision of improvement for all project and system related elements.

While applying the SUITE framework through its methodologies is required, SUITE was not designed to add layers of complexity to project execution. There will be no additional costs from the Contractor, since it is expected that they are already following industry best practices which are at least similar to those that form SUITE's foundation.

SUITE's companion templates are used to document project progress or deliverables. In some cases, Contractors may have in place their own set of templates for similar use. Because SUITE can be tailored to fit specific projects, project teams and State project managers may decide to use the Contractor's provided templates, as long as they demonstrate fulfillment of the SUITE methodologies.

Contractor has reviewed the SOM Project Management SUITE Manual. The SOM process is consistent with industry standard best practices and Contractor's internal process. Contractor's process is also based on PMBOK as its authoritative source. As a result, Contractor will work closely with the State to follow the established process and deliver all the required documentation.

Contractor understands that the Project Management Methodology is intended for all project stakeholders, including:

- Sponsors
- Project managers
- Project team members (DTMB, customers, and vendors)
- Project management mentors and instructors
- Project Management Offices (PMO)
- Enterprise Portfolio Management Office (EPMO)
- Project QA teams
- Individuals interested in learning more about project management

Contractor's Team will work closely with all the team members to deliver the project in accordance with the SUITE Project Management Process. Contractor will meet with the State prior to preparing the requested documentation to discuss Contractor's approach and receive initial feedback from the State on preferences, restrictions, limitations, and/or changes. All plans must be submitted to the State for review comment and potential modification. Contractor will address all comments received and resubmit to the State for acceptance. Contractor understands that multiple resubmittals may be required before the plan is accepted by the State. Contractor will submit the initial documents in accordance with the included project schedule.

Contractor also understands the process is dynamic and fluid. Aspects of the process may need to be repeated/or updated as the project moves forward and new tasks are approved.

At the highest level, DTMB defines the project life-cycle phases as follows:

The Initiation phase was completed in preparation of the RFP. From the point of selection, Contractor will play the key role in ensuring the project is managed appropriately and in accordance with SOM's Management Process. Upon the start of the contract, one of Contractor's first tasks will be to develop a Project Management Plan in coordination with the project team and in accordance with the Contract and State's guidelines. The PMP will include:

- Project Summary
- Updated Project Schedule
- Human Resource Management Plan
- Updated Project Budget Estimate

- Communication Management Plan
- Change Management Plan
- Quality Management Plan
- Risk Management Plan
- Issue Management Plan
- Approval Information

Sections of the PMP may be delivered as separate documents as defined in the Contract. As part of the initial Project Planning Stage, Contractor will also develop the following plans in accordance with the details identified in the Contract:

- Requirements Confirmation
- System Architecture and Design Plan
- Training Plan
- System User Documentation (SUD)
- System Installation Guide (SIG)
- Software Development Plan
- Interface Control Plan
- Data Dictionary
- Configuration Management Plan

All plans, documentation, manuals, and updates will be submitted in soft copy in the latest version of the appropriate Microsoft application (i.e., Word, Excel, Access, PowerPoint, Visio, Project) and PDF. Final accepted versions of all documentation will be delivered in soft copy in a format that is acceptable to the State.

All aspects of project planning and management will be conducted in close coordination with the State's Project Team and in accordance with DTMB SOM Project Management Methodology adapted as appropriate for the project-specific details and scope.

Contractor will be responsible for submitting all detailed plans as defined below. Contractor will meet with the State prior to preparing the requested documentation to discuss Contractor's approach and receive initial feedback from the State on preferences, restrictions, limitations, and/or changes. The proposed plans must be submitted to the State for review comment and potential modification. Contractor will be responsible for addressing all comments received and resubmitting to the State for acceptance. If a resubmittal is deemed to not adequately address all comments, multiple resubmittals may be required before the plan is accepted by the State. The required submittal timeframe for each plan is provided in the milestone table below. Any need for resubmittal shall not be seen as a cause for delay in completing the project in accordance with the overall Project Milestones. Multiple simultaneous submittals may extend the State's review times.

Acceptance of documents shall not relieve or limit Contractor's responsibility to provide a system in full compliance with the Contract. Deviations from the Contract requirements that may be contained within Contractor's submitted documents, even though the document may be accepted by the State, shall not have the effect of modifying Contract requirements. Only specific requests to the State from Contractor for waivers or specification change that are formally accepted by the State will change requirements in the Contract.

Each plan identified below must include (at a minimum) the following detail.

1. **Project Schedule**
    - Shall include project tasks, including inputs, approach, outputs, constraints, and critical path items.
    - Shall include a Work Breakdown Structure (WBS) in chart format illustrating tasks, sub-tasks, predecessors, meetings, trainings, workshops, and deliverables on a timeline.

- Shall include detail through all project phases, including documentation, software development, testing, integration, transition, and training.

2. **Risk Management Plan**
   - Shall addresses the processes for identifying, assessing, mitigating, and monitoring the risks expected or encountered during the project's life cycle.
   - Shall identify the roles and responsibilities of all participating organizations for risk management.
   - Shall identify 1) risks; 2) assess the relative level of risk as either: likely, probable, improbable, and impossible; 3) prioritize risks; 4) identify risk mitigation for likely, probable, and improbable risks, 5) define methods for monitoring risks, and 6) identify risk owner/lead.

Contractor will continually monitor and take action on situations that could compromise the quality of the product, jeopardize timeliness of its delivery, or increase its cost. Risk assessments will be conducted monthly, or as needed, with critical decision points by the Project Manager to assure appropriate action is taken and all risks are being mitigated. The Contractor's Project Manager will solicit input from relevant project team members, MDOT Project Manager, and work with senior management to resolve unmanageable issues if/when necessary.

Contractor is responsible for establishing a risk management plan and process, including identification and recording of risk items, prioritization of risks, definition of mitigation strategies, monitoring of risk items, and periodic (at status meetings) risk assessment reviews with the State.

Contractor's risk management plan and process are defined in this project plan. Once both parties have agreed to the format of the plan, it shall become the standard to follow for the duration of the contract. The plan will be reviewed monthly with status meetings, or as agreed upon.

Contractor will track risks and report the status monthly as part of the monthly project status meetings. Contractor will work with the State and allow input into the prioritization of risks. Contractor will identify risks for each phase of the project. Mitigating and/or eliminating assigned risks will be the responsibility of Contractor. The State will assume the same responsibility for risks assigned to them.

Risk Management Process
Contractor's project management personnel will identify and prioritize initial project risks by severity and likelihood of occurrence and impact. Project risks will be re-evaluated monthly and reviewed with Contractor's senior management quarterly. All situations requiring resolution (e.g., decisions to be made) will be identified, their impact assessed, and their resolution assigned to project team members for resolution. Follow-up on assigned issues will be done to assure timely resolution.

Assessments of project risks and the changing project environment will be reviewed monthly to ensure ongoing risk monitoring and control. Potential situations negatively impacting the project will be identified and used to develop and implement risk mitigation actions.

Risk Characterization (Initial Assessment)
Based on review of the scope of work and the project requirements, there are no unusual or significant safety, technical, political, or environmental risks associated with this project.

The Contractor's Project Manager understands the principles of risk management and possesses a thorough understanding of the types of risks commonly encountered on this type of project and effective methods of identifying and controlling those risks.

The Contractor's Project Manager and State's Project Manager will determine if changes in the scope of work or project requirements will cause this risk analysis to be revised.

3. **Quality Management Plan**
   - Shall define how Contractor will demonstrate compliance with the Contract requirements and/or standards.
   - Shall describe the self-check process and/or procedures performed to ensure deliverables meet requirements and the documentation and/or records are maintained.

- Shall define quality staff and demonstrate that all quality staff are qualified, experienced, and have the proper skills/background.
-
- Shall define procedures that ensure any and all failures, malfunctions, deficiencies, defects, deviations, etc., are corrected and/or documented according to the Quality Management Plan and Contract requirements.

A Quality Management Plan (QMP) will be developed as part of the PMP development. The QMP will define how Contractor will complete the project in compliance with the contract requirements and/or standards. The QMP will describe the process and/or procedures performed to ensure deliverables meet requirements and the documentation and/or records are maintained. It will identify quality staff and demonstrate that all quality staff are qualified, experienced, and have the proper skills/background. The QMP will define procedures that ensure all failures, malfunctions, deficiencies, defects, and deviations are corrected and/or documented according to the QMP and contract requirements.

The QMP will ensure quality is planned, define how quality will be managed, define QA activities, define QC activities, and define acceptable quality standards.

Contractor acknowledges that the State SUITE SEM provides “stage exits” or points in time during the project when the customer and stakeholders will review the deliverables in detail and accept or reject the work (or accept with noted revisions). Contractor understands and agrees with the State’s seven-stage process.

The project will use verification, validation, and structured walkthrough techniques to promote quality in deliverables as required in the State’s Project Management Methodology Document.

The State’s Quality Management Procedures will be merged with Contractor’s multi-stage quality management and testing process. The QA/testing role exists throughout the project. The QA resource will review all QA deliverables as each phase concludes and provide feedback to the creator. The requirement will be tracked through Jira, as well as the verification process for each of the requirements. The test plan will show which design and test case fulfills each requirement.

PROJECT TEAM SYSTEM DEPLOYMENT QUALITY RESPONSIBILITIES

Task	Purpose	Ownership Responsibility
Unit Testing Occurs in the development phase.	Validate proper function of design changes/customizations Performed at the unit level	Developers
Integration Testing Follows unit testing and precedes system testing.	Ensure the application is moved to the QC/test environment and ensure individual modules are combined and working as a group Performed in the Contractor’s development environment	Developers
System Testing Follows integration testing and precedes load/stress testing.	Discover defects by doing an end-to-end test of the business processes and functionality within the application rather than of its individual components; test the function of an application as a whole Exploratory Testing Can be performed in the Contractor’s environment or onsite in the client’s QA environment depending on the project-specific setup	QA Team
Load Testing follows System Testing	Validate the system performance in a high transaction rate or high amount of users, and/or with simulated devices or interfaces as appropriate	QA Team and/or Developers

Task	Purpose	Ownership Responsibility
	Ensure environment stability Can be performed in the Contractor's environment or onsite in the client's QA environment depending on the project-specific setup Applied for larger builds that may affect overall system performance	
Regression Testing	Ensure that the introduction of new functionality did not impact existing functionality Addresses all aspects of the system that may be affected by the new code	Either QA Team
Client-Level QA Testing	When a client QA environment is provided, Contractor's QA Team will retest all aspects of the build again when it is deployed in the client's QA environment Contractor's project team will work closely with the client to make the client's QA environment as close as possible to the Production environment Test field devices will be utilized when available to ensure proper functionality out to the field device	QA Team
User Acceptance Testing (UAT) follows Client Environment QA Testing and precedes Release to Production	Validate proper functionality of the application by the stakeholders (i.e., business users) based on original requirements of the project Testing follows formal test plan provided by Contractor and approved by the client Significant functional failures may result in suspension of the UAT and complete retesting Any minor failures are documented and retested prior to final acceptance	Business owner and/or selected end users with support from Contractor's QA Team
Pre-Implementation QA Checklist	Ensure required deliverables have been successfully completed prior to release Includes full documentation of UAT Test Plans Test Plans are developed off the System Functional Requirements and verified that all requirements are addressed in the UAT Test Plan	QA Team and Project Manager

4. **Requirements Confirmation**
   - Shall include meetings where Contractor must review each requirement and demonstrate how each requirement will be met. Any requirement adjustments and/or proposed workarounds must be approved by the State.
   -
   - At the conclusion of the requirement confirmation meetings a Draft Requirements Confirmation Document deliverable must be provided to the State to document the results of the validation sessions, requirement revisions, and/or approved workarounds.

To fulfill the requirements of the FHWA systems engineering process and help ensure the State fully understands and agrees to what is being provided in the system, the identified stakeholders will be involved in the assessment process. Requirements workshops will be held very early in the project. These workshops will allow the Contractor's Team and the State and its stakeholders to augment, clarify, refine, and add/or delete system requirements developed for the Contract.

As part of the requirements workshop, Contractor will walk through the new initial requirements and, to the extent possible, demonstrate how the requirements will be fulfilled through system demonstrations. These visual system walkthroughs will provide the State with valuable insight on how the requirements will be met and an understanding of what changes will need to be made to fully meet the full set of requirements. More than one workshop may be required to walk through all the new requirements and system components. Data collection and performance measurements are an important part of the system installation. As part of the workshop, Contractor will work with the State to determine data collection, performance measures, and data exchange needs for all the new requirements.

Any requirement adjustments and/or proposed workarounds will be approved by the State. At the conclusion of the requirement workshops, a Draft Requirements Confirmation Document deliverable will be provided to the State to document the results of the sessions, requirement revisions, and/or approved workarounds.

5. **System Architecture and Design Plan**
    - Shall include detailed design plans of the network components, including physical and logical cores, physical and logical servers, physical and logical access, Virtual Local Area Networks (VLANs), Virtual Private Network (VPN) users, equipment vicinity, and rack layout as applicable.
    - Shall include detailed descriptions of:
        - All servers such as application servers, database servers, communication servers, directory servers, clock servers, test servers, backup servers, Internet Information Services (IIS) servers, and others;
        - Typical workstations configurations including monitors and printers;
        - Uninterruptible Power Supplies (UPS), switches, power switches, routers, firewalls; and
        - Field devices that will be managed or monitored by the system.
    - Shall include interfaces between subsystems and external systems.
    - Shall include security compliance.
    - Shall include information requested by the State during the Enterprise Architecture Solution Assessment (EASA).

In addition to the high-level diagram provided in Section 9, Contractor will develop a detailed system architecture and design plan for all the new system customizations. The current iNET ATMS deployment meets most of the system requirements already. Many of the new requirements have already been developed for other clients or as part of modules that the State has not already deployed. There will be no significant changes to the current architecture except related to the management and distribution of video images.

6. **Training Plan**
    - Shall include the various levels of training needed for all user classifications, session topics with agenda, delivery format, trainers, and equipment used.
        - Contractor will develop Training plans for all features (including new) that are added as part of this project. Training for any significant changes will be provided online and in person similar to past training for significant system additions.
        - Training will typically include PowerPoint and hands-on training with the system. For major modules that have a significant impact on operations, Contractor will also provide onsite support for operations to ensure the State staff fully understand how to make the best use of the new system features.

7. **System User Documentation (SUD)**
    - Shall detail all functionality of the ATMS software.
    - Shall include troubleshooting techniques and other user help information.
    - All system modifications will include updates to the User and Administrators Manual as appropriate. Manual updates will be provided along with the training material prior to moving the updates from QA to production.
    - The manual updates will include appropriate screenshots and step-by-step instructions for the users or system administrators as applicable.

- Manuals will always be available online on the project web site and will be provided to MDOT and DTMB in electronic format.

8. **System Installation Guide (SIG)**
   - Shall define the installation, integration, and configuration of all ATMS hardware, software, and modules, supporting operating systems, databases, 3rd party software, and any other software as needed for a full and complete solution.
   - For each new build, Contractor will provide the State with full build instructions and rollback plans where appropriate and applicable. Scripts will be provided to support the upgraded installation as required. Contractor will provide a system installation guide with all the details as requested by MDOT in this Contract.

9. **Software Development Plan**
   - Shall include narrative descriptions and screenshots for phasing, software development, downstream impacts (detailed in the Risk Management Plan), response plan development, configuration, and/or customization of the Commercially Off the Shelf (COTS) product(s).
     - Contractor will provide an initial software development plan that describes the overall development process and a schedule of anticipated builds to add all the new system functions. Contractor will coordinate closely with MDOT in the development of the plan and the schedule for build deployments.

10. **Interface Control Plan**
    - Shall include the physical, functional, and content characteristics of both internal and external interfaces to a system, and the responsibilities of the organizations on both sides of the interface.
    - Shall include 3rd party vendors and other existing hardware and software providers that the ATMS will interface and integrate with.
      - All new features will be closely reviewed with MDOT prior to scheduling their deployment.

11. **Data Dictionary**
    - Shall contain the information necessary to describe ATMS system and API data elements, including name, type, max length, description, mandatory/optional.
    - Contractor will update the existing data dictionary to accurately reflect the recently upgraded version of iNET for MDOT and all new changes.

12. **Configuration Management Plan**
    - Shall define the set-up and configuration of maps, user access, alerts, logs, standard reports, dashboards, schedules, etc.
    - Shall outline processes, procedures, and responsibilities for documenting and implementing changes, modifications, and enhancements. This includes the design requirements, acceptance, and approval authorities.
    - Contractor will work with MDOT and DTMB closely and update the document as required to include details on system configurations for maps, user alerts, system logs, and reports.

Validate Test and Production Environments

Contractor has an MDOT ATMS development environment set up in Contractor's Schaumburg, Illinois, office. DTMB has a Development, QA, and Production environment set up for the MDOT iNET ATMS. There will be no significant changes to any of the environments. MDOT Development, QA, and Production are set up in a virtual environment. As new functionality, such as new corridors and ramp metering, is added, Contractor will want to assess the resource loading on the Production environment. At that time, there is likely to be a need to increase the resources allocated to Production services. This discussion will be made as the new field devices and functionalities are added.

Deployment Transition Plan

iNET is fully operational in the DTMB/MDOT environment. However, where transition is required to iNET, Contractor follows the following procedure.

To assist the State in operating, maintaining, and deploying the ATMS, Contractor will develop a training and deployment transition plan (TDTP) that will correspond to the system operation, administration, and transition

activities. In general, the TDTP will describe an extensive set of transition plan activities, including a step-by-step set of procedures that describe a logical phased cutover approach to the new ATMS, including any connections to relevant ancillary systems and supporting communications networks. The focus of the TDTP will be maintaining operational uptime and minimizing any potential downtime. iNET is designed with the latest technologies to create a smooth transition. This transition experience will provide the client with a seamless cutover solution that will minimize operational disruptions. The TDTP will analyze the systems to transition, as well as the types and sources of data, interfaces, and communications.

The plan will align with the agreed-upon software releases and milestones so ATMS data are available to support the software development, deployment, testing, and acceptance for each milestone. Techniques and tools for automating the data migration will be discussed in the TDTP so existing tools can be reused and new tools created or leveraged as necessary. Contractor has structured TDTP work activities based on Agile development process, which includes implementation milestones where Contractor will customize/implement functionality within the iNET product as necessary to satisfy all client requirements. The milestones are defined to represent the completion of a software development sprint, which includes the following high- level tasks that lead to validation and integration:

- Review requirements for each customization/development sprint
- Customize/develop functional requirements as expected
- Validate in the Contractor's development and client environments
- Coordinate with client Operations and IT for access for integration
- Validate integration points with external systems/devices as available

User Acceptance Testing Plan
Outside of the user manual that is updated with each release, Contractor will include a test plan for explaining the new functions and a step-by-step procedure to allow the users to learn the new feature while also testing it against their usual standard operating procedures. This is done to a larger extent for major releases to create a UAT plan. Each item in the UAT has a sign off for the client and Contractor to either confirm functionality or provide notes on observed issues.

Test results are aggregated into pass, partial issue noted, and failed. The entire test plan is retained, and once Contractor has addressed all the partial issues and failed items, the test is conducted again. After each test, the group is notified of the findings and an overview of the number of items in each bin.

Milestones/Deliverables for Implementation

The State's proposed milestone schedule and associated deliverables are set forth below.

Milestone	Deliverables	Schedule (calendar days)
General Project Management	Project Kickoff	Contract Execution + 10 days
	General Project Management Activities	Per Approved Project Tasks
	Meetings and Meeting Summaries	As Needed
	Project Control and Reports	Per Approved Project Tasks
Project Documentation	Project Schedule	Contract Execution + 30 days
	Risk Management Plan & Quality Management Plan	Contract Execution + 60 days
	Requirements Confirmation Document	Contract Execution + 90 days
	System Architecture and Design Plan	Contract Execution + 90 days
	Training Plan	Contract Execution + 150 days
	Systems User Documentation	Contract Execution + 150 days
	System Installation Guide	Contract Execution + 150 days
	Software Development Plan & Interface Control Plan	Contract Execution + 150 days
	Data Dictionary	Contract Execution + 180 days
	Configuration Management Plan	Contract Execution + 180 days

Provision Environment	Validate Test and Production Environments	Contract Execution + 180 days
Software Development, Configuration, and Testing	Software Development	Per Approved Project Tasks
	Deployment Transition Plan	Contract Execution + 100 days
	User Acceptance Testing Plan	90 days prior to UAT
	User Acceptance Testing (UAT) Results	Per Approved Project Tasks
Solution Integration and Acceptance	Successful integration for 100% of ITS devices	Per Approved Project Tasks
	Successful Burn-in Completion for 100% of Solution	60 days following start of burn-in
Training	Administrative and End-User Training for Implementation, Go-live Support, and Transition to Customer Sufficiency	Per Approved Project Tasks
	Initial Trainings	Every 30 days for 12 months, beginning 60 days prior to Solution Testing and Acceptance
	Basic Training Course	Annually or upon request
	Advanced Training Course	Annually or upon request
	New Software Build Training Course	Within 30 days of each major software enhancement and/or build
Operations and Maintenance	Warranty Period (free of charge)	Per approved Burn-In Completion + 90 days
	Ongoing after Final Acceptance.	Begin at end of Warranty Period Ongoing

23. ADDITONAL INFORMATION

The State reserves the right to purchase any additional services or products from the Contractor during the duration of the Contract.

The iNET platform is highly modular, configurable, and customizable. The 36 functional modules can be installed one at a time, piecemeal, or all at once. See the iNET Module table in Section 9. This includes new modules for CAVs, AI, ML, traffic prediction, big-data analytics, IoT, voice-driven assistance, and enhanced traffic signals module and ATSPM support.

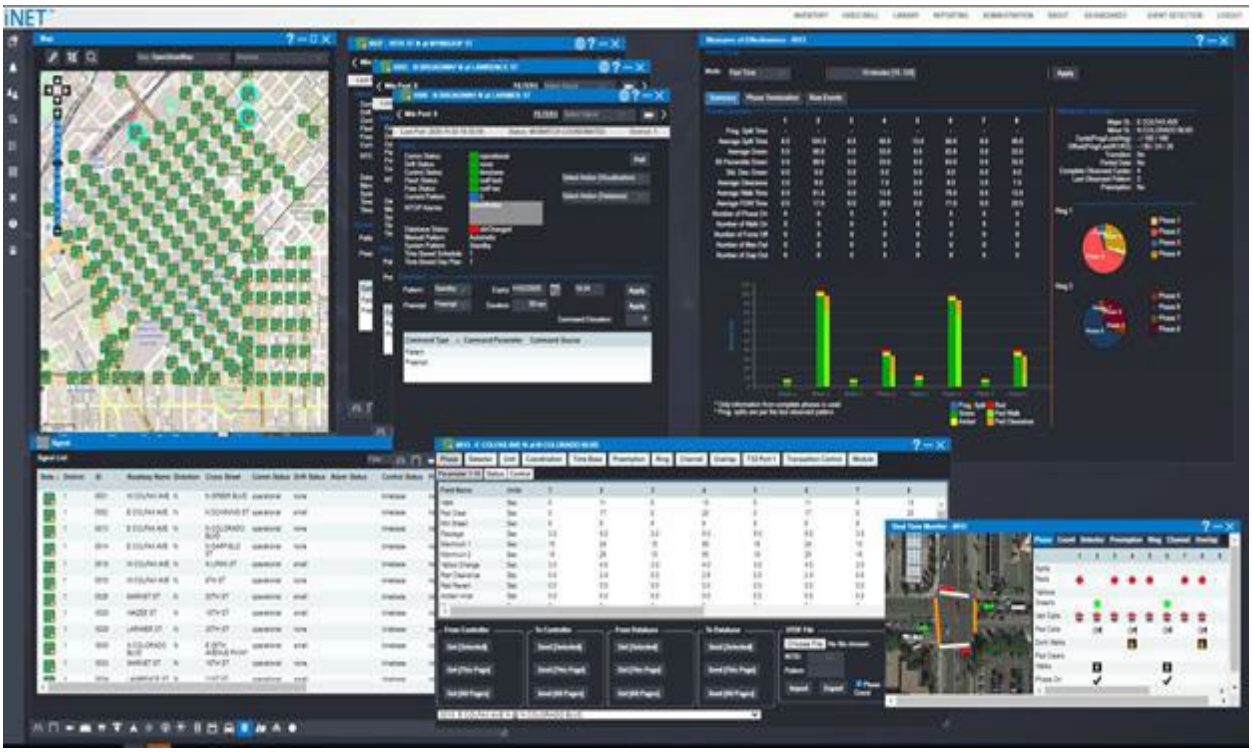
Connected and Autonomous Vehicles and Large-Scale Data Integration
Contractor is not an original equipment manufacturer (OEM), and as a result, does not drive the autonomous vehicle industry. Contractor has been a consistent leader in the integration of vehicle information into live traffic management programs. Contractor's ATMS have been using vehicle probe data for more than 20 years.

Contractor was the first to use Wejo 3-second vehicle updates in an ATMS to derive travel times, congestion zones, origin/destination, and regional traffic patterns. Wejo data provide trip ID, vehicle location, trajectory, and speeds from two OEMs recent vehicles in near real time. This added granularity provides significant advantages over the traditional HERE or INRIX datasets. With individual vehicle data updates every 3 seconds, there are many advantages in relation to queue warning, work zone management, and arterial system management. The dataset also provides a much closer representation of the data that will be available from CAVs. These much larger datasets provide a lot of opportunity and additional challenges for DOTs.

Signal Technologies
Contractor is not a signal controller product provider. However, the iNET platform includes a full-featured traffic signal system that can support the full integration with multiple vendor signal controllers. See the Device Integration attachment for a list of supported controllers. In addition, Contractor's ATMS platforms are integrated with several signal vendor central signal platforms, which are also listed in Device Integration attachment. Contractor can support fully integrated freeway and arterial solutions that can utilize the latest probe and CAV data while providing a solution that can be integrated across multiple vendor platforms. For MDOT, staying with the iNET platform means does not need to align itself with just one signal controller provider to leverage the emerging probe and CAV-related opportunities to optimize the State's freeway and arterial operations.

iNET Traffic Signal Management Solution is compatible with signal controllers conforming to the requirements of NTCIP 1201 v03, NTCIP 1202:2005 v2.19, NTCIP 1103 v2.17, and applicable base standards per “Level 2 NTCIP Conformance” as specified in NEMA TS2. This module includes an AI-based traffic responsive signal control component, which is responsible to activate appropriate patterns in response to unexpected traffic conditions using a rule-based AI inference engine. This module implements the DSS response plan (i.e., intelligent response rules’ weights) and prepares the signals to respond with the best timing plan for the detected and forecasted conditions. Using ATSPM, along with the health monitoring of the signal system and its infrastructure, iNET Intelligent Signal Performance Service module can provide a real-time method for monitoring, maintaining, and continually updating traffic signal parameters for optimal operations. Figure below illustrates the iNET Traffic Signal Control Solution virtual desktop as it would appear to an operator while monitoring intersection operations.

INET SIGNAL SYSTEM DESKTOP SAMPLE VIEW



Intelligent Intersections solution provides a map-based dashboard with ATSPM and other metrics, such as travel time and signal availability, to help you identify hotspots priorities and the ability to drill down with a simple click.

- Purdue phase termination
- Split monitor
- Pedestrian delay
- Preemption details
- Turning movement counts
- Purdue coordination diagram
- Approach volume
- Approach delay
- Arrivals on red
- Approach speed
- Yellow and red actuations

- Split failure
- + Availability metrics

Contractor's Intelligent Intersections solution automates signal retiming by applying proprietary algorithms to existing timing plans and GPS traffic data (e.g., INREX or Wejo). What used to be a labor-intensive process is now a seamless exercise that can be completed in minutes. This kind of efficiency allows agencies to retime signals with greater frequency as traffic conditions evolve —quarterly or annually—instead of every 5 years. These visualizations further enable agency staff to assess and maximize the benefits of these signal retimings.

SCHEDULE A – TABLE 1 - Business Specification Worksheet

Contractors must respond to each business Specification on how they will meet the requirements in the document provided. Contractor must not alter the document.

The Business Specifications Worksheet contains columns and is defined as follows:

Column A: Business Specification number.

Column B: Business Specification Type – (M) - Mandatory, (R) - Required, (O) - Optional.
NOTE:

- The "**Mandatory Minimum**" section of the Business Specifications Worksheet, all items listed under this section must be met by the Contractor to avoid disqualification. Further, Contractor must provide adequate documentation to support such Mandatory Minimum requirements.
- The "**Required**" section of the Business Specifications Worksheet lists items that the State requires to be part of the Solution, but if not met will not result in disqualification. "Required" items will be evaluated and scored upon per the State evaluation process. If Contractor cannot meet the requirement as written, but meets functionality using another method, response in Column E will describe. If Contractor requires configuration, customization, or future enhancement to meet requirement, any additional cost must be included in Schedule B - Pricing.
- The "**Optional**" section of the Business Specifications Worksheet lists items that are not required at the time of the solicitation but may be desired by the State in the future. Such "Optional" items will be evaluated and used in a best value award recommendation. Costs to meet optional requirements must be included in Schedule B - Pricing. Contractor to identify if optional requirement is provided at no additional cost.

Column C: Business Specification description.

Column D: Contractor must indicate how it will comply with the business Specification. Contractor must enter **"Y"** to one of the following:

- **Current Capability –** This capability is available in the proposed Solution with no additional configuration or cost
- **Requires Configuration –** This capability can be met through Contractor-supported changes to existing settings and application options as part of the initial implementation at no additional cost (e.g., setting naming conventions, creating user-defined fields).
- **Customizations to Software Required** – The requirement can be met through Contractor modifying the underlying source code, which can be completed as part of the initial implementation.
- **Future Enhancement –** This capability is a planned enhancement to the base software and will be available within the next 12 months of contract execution at no additional cost.
- **Not Available –** This capability is not currently available, and a future enhancement is not planned.

NOTE: Configuration is referred to as a change to the Solution that must be completed by the awarded Contractor prior to Go-Live but allows an IT or non-IT end user to maintain or modify thereafter (i.e. no source code or structural data model changes occurring).

Customization is referred to a modification to the Solution's underlying source code, which can be completed as part of the initial implementation. All configuration changes or customization modifications made during the term of the awarded contract must be forward-compatible with future releases and be fully supported by the awarded Contractor without additional costs.

Contractor shall understand that customizations (i.e. changes made to the underlying source code of the Solution) may not be considered and may impact the evaluation of the Contractor's proposal.

Column E: The Contractor must also fully disclose how they will meet the requirements in their proposal response. **This column is for Contractor to describe how they will deliver the business Specification and if the Contractor proposes configurations or customizations, the Contractor must explain the details of the impacted risk that may be caused if configured or customized to meet the business Specification.** Description must be no more than 250 words for each business Specification (may include references to proposal).

Business Requirement Contents:

A. General Software
1. Data Storage
2. Network Protocols
3. System Administration
4. Software
5. GUI
6. Map

B. Field Devices
7. Field Devices (General)
8. Dynamic Message Signs (DMS)
9. CCTV (temporary and permanent)
10. Environmental Sensor Stations (ESS)
11. Vehicle Detection Systems

C. Operations
12. Response Plans
13. Event Management
14. Travel Times

D. Monitoring
15. Alerts
16. Notifications
17. Dashboards
18. Reports
19. Call Tracking

E. Interfaces
20. Email, Text, and Social Media Interfaces
21. Lane Closure and Restriction (LCR)
22. Mi Drive
23. Weather Feed
24. Probe Data
25. Automated Vehicle Location (AVL)

F. Managed Corridor Strategies
26. Strategy: Dynamic Lane Control and Dynamic Shoulder Use
27. Strategy: Variable Speed Advisory
28. Strategy: Queue Warning
29. Strategy: Ramp Metering
30. System: Flex Route
31. System: Active Transportation and Demand Management (ATDM)

G. Systems
32. Border Wait Time System
33. Parking and Information Management System (PIMS)
34. Integrated Corridor Management (ICM) System
35. Warning Signs and Indicators
36. Curve Warning System

A	B	C	D					E
Business Specification Number	**Business Specification Type**	**Business Specification Description**	**Current Capability**	**Requires Configuration**	**Requires Customization**	**Future Enhancement**	**Not Available**	**Contractor to explain how they will deliver the business Specification. Explain the details of any configuration/customization and the impacted risk that may be caused if configured or customized to meet the business specification.**
		General Software						
1		Data Storage						
1.1	R	The ATMS must retain and store data collected by the ATMS in accordance with MDOT's ITS/TOC Retention Schedule.	X					iNET ATMS fully meets this requirement
1.2	R	The ATMS must include an active database that stores real time system status data, system events (e.g., alerts), and user activity.	X					INET ATMS fully meets this requirement
1.3	R	The ATMS must include an archive database that stores system data greater than 2 years old outside of the active database for durations specified by MDOT's ITS/TOC Retention Schedule per data type.	X					INET ATMS fully meets this requirement
1.4	R	The ATMS must provide the ability to query and retrieve system data in the archive database.	X					INET ATMS fully meets this requirement
1.5	O	The ATMS should be able to retrieve stored data to simulate or replay operation of the system in the test environment to support testing, operator training, and demonstrations to stakeholders.	X					INET ATMS fully meets this requirement. Data from Production Archive can very easily be restored to Test environment.
1.6	R	The ATMS must provide all the necessary utility operations for backing up and restoring the ATMS databases to an external storage device.	X					ATMS will provide the necessary utility to back up and restore of database to external devices
1.7	R	The ATMS must not limit the size of the databases or database record fields other than that imposed by the hardware storage capacity. The Contractor will coordinate with the Owner to determine the amount of storage space needed at time of procurement.	X					iNET ATMS has no limit size for the database sizes or their record fields outside of the hardware constraints.
2		Network Protocols						

A	B	C	D					E
Business Specification Number	**Business Specification Type**	**Business Specification Description**	**Current Capability**	**Requires Configuration**	**Requires Customization**	**Future Enhancement**	**Not Available**	**Contractor to explain how they will deliver the business Specification. Explain the details of any configuration/customization and the impacted risk that may be caused if configured or customized to meet the business specification.**
2.1	M	The ATMS must support the ability to communicate with field devices via IP Networking.	X					iNET ATMS fully meets this requirement
2.2	M	The ATMS must provide the ability to communicate with field devices using the National Transportation Communications for Intelligent Transportation System (ITS) Protocols (NTCIP), provided those field devices are capable of communicating using NTCIP.	X					iNET ATMS fully meets this requirement
2.3	N/A	The ATMS must include the ability to communicate with field devices via the following applicable communication protocols:						
2.3.1	R	Transmission Control Protocol (TCP)	X					iNET ATMS fully meets this requirement
2.3.2	R	User Datagram Protocol (UDP)	X					iNET ATMS fully meets this requirement
2.3.3	R	Simple Network Management Protocol (SNMP)	X					iNET ATMS fully meets this requirement
2.3.4	R	Internet Group Management Protocol (IGMP)	X					iNET ATMS fully meets this requirement
2.4	O	The ATMS must include the ability to communicate with other centers via ITE's Traffic Management Data Dictionary (TMDD) Standard (version 3.1)	X					iNET ATMS fully meets this requirement
3		System Administration						
3.1	R	The ATMS must comply with Section 6 – Access Control and Authentication, of the statement of work regarding login and authentication capabilities.	X					iNET ATMS fully meets this requirement
3.2	R	The ATMS functions must not be available until the authorized user successfully logs in.	X					iNET ATMS fully meets this requirement

A	B	C	D					E
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3.3	R	The ATMS must provide role-based access controls and allow authorized users to define and assign different user access levels which enable and/or restrict all features, functions and/or data available based on permissions of the user.	X					iNET ATMS fully meets this requirement
3.4	R	The ATMS administration functionality must include user account creation, deletion, and role assignment.	X					iNET ATMS fully meets this requirement
3.5	R	The ATMS must provide the ability to generate automated emails to ATMS users regarding access information for their user accounts, such as notifications to update a password.	X					iNET ATMS fully meets this requirement
3.6	R	The ATMS must provide the ability to automatically disable a user account after a defined duration of inactivity, adjustable at the system level.	X					iNET ATMS fully meets this requirement
3.7	R	The ATMS must provide the ability to track user activity at minimum including login, logout, and login attempts (successful and failed).	X					iNET ATMS fully meets this requirement
3.8	N/A	The ATMS must provide the ability for authorized users to maintain the following system data, at a minimum:						
3.8.1	R	User input fields and corresponding drop-down lists	X					The system configurations are already in place in the current MDOT iNET ATMS system that meet this requirement.
3.8.2	R	Automated actions	X					The system configurations are already in place in the current MDOT iNET ATMS system that meet this requirement.
3.9	N/A	The ATMS must provide the ability to partition access by authorized users based on the following:						
3.9.1	R	Geographic area (a minimum of four TOC coverage areas, seven MDOT regions, and all Michigan Counties and Cities)	X					iNET ATMS allows quick and easy configurations based on geographic area. These are already configured in the current iNET ATMS system for MDOT.

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3.9.2	R	Roles	X					Roles can very easily be set up and configured within the ATMS. These are already configured in the current iNET ATMS system for MDOT.
3.9.3	R	Device types by assigning specific devices into groups to which users and user groups can be assigned permissions	X					Users, User groups and permissions can be very easily configured within iNET ATMS. These are already configured in the current iNET ATMS system for MDOT.
3.9.4	R	System types	X					System types are easily configurable in iNET ATMS. These are already configured in the current iNET ATMS system for MDOT.
3.10	R	Authorized users must be able to add devices within the ATMS without Contractor support.	X					iNET ATMS provides very intuitive GUI to add and configure devices without contractor support.
3.10.1	O	The ATMS must provide the ability to add multiple devices in batches within the ATMS without Contractor support.		X				iNET ATMS can be configured such that user can upload a file in csv format to load data into the ATMS tables.
3.10.2	O	The ATMS must provide the ability to assign device input fields as required or optional, where optional fields can be left blank and will not prohibit the device from being added to the ATMS.	X					iNET ATMS can be configured to make only certain input fields required and mark others optional as desired by the client.
3.11		The ATMS must provide the ability to edit device within the ATMS without Contractor support.	X					iNET ATMS fully meets this requirement
3.12	R	In compliance with DTMB published standards, the ATMS must automatically log off users after a system defined and modifiable period of inactivity (e.g., if a user has no activity on the ATMS for 15 minutes, they will be automatically logged off).	X					iNET ATMS fully meets this requirement
3.13	R	The ATMS must gray out or not show features that a user is not authorized to access. If grayed out, the ATMS must display a message indicating that the feature is not available for that user.	X					iNET ATMS fully meets this requirement

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4		Software						
4.1	R	The ATMS must include a web browser-based application, the software must run under commonly used web browsers and stay compliant with State of Michigan standards.	X					iNET ATMS fully meets this requirement.
4.2	R	The ATMS must provide users access to the system via a TOC workstation.	X					iNET ATMS fully meets this requirement
4.3	R	The ATMS must provide users access to the system via a mobile device (phone/tablet) through a remote access method compliant with DTMB policies.	X					iNET ATMS fully meets this requirement
4.4	R	The ATMS must timestamp and record all activities and commands performed within the software, both manual and automated features. The ATMS must provide the ability for an authorized user to configure the ATMS to not record specific activities and commands (e.g., PTZ commands). Contractor to use Column E to provide overview on their ATMS capabilities for recording activities and commands (e.g., what activities can or cannot be logged, how long is the recording stored).			X			iNET ATMS records all activities and commands performed with software including both manual and automated using Archivers. For eg: All messages sent to DMS signs including a manual message or an automated Response Plan message will be archived in the database with clear timestamps. Recorded data is stored in the Archive database schema. These Archivers can be turned ON or off in the system but presently not configurable. Contractor will work with the State of Michigan to identify a list of Archivers that they want to be configurable. Software Customizations will be made in order to provide a way for authorized users to make these configurations through the ATMS UI. MDOT/DTMB currently manages both short term and long term storage of Archived data. Contractor will continue to provide assistance in this regard.
4.5	R	The ATMS must record all managed corridor and system activations and deactivations along with the condition triggering the activation/deactivation.	X					iNET ATMS fully meets this requirement. The current iNET ATMS for MDOT already has configurations in place that meet this requirement.
4.6	R	The ATMS must have documented Application Program Interface(s) (APIs) that supports current recognized industry standards that will enable all data collected through the ATMS to be shared and integrated with other systems.	X					All the API documentation related to data collection, exchanges in compliance with industry standards are available.
4.7	R	The ATMS must display changes to the system in near real-time with appropriate consideration for network	X					iNET ATMS fully meets this requirement.

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		latency by communication media, device location, or other factors outside the control of the ATMS supplier.						
4.8	R	The ATMS must provide an open, scalable architecture that can be integrated with other software, systems, hardware or equipment for the purpose of streamlining traffic operations and event management.	X					iNET ATMS is an open and scalable architecture that can be very easily integrated with other external systems.
4.9	R	The ATMS must be able to scale without a decrease in performance (map lag, device layer displays, display of lists, execution of queries, etc.) with increased operational demands.	X					iNET ATMS fully meets this requirement.
4.10	R	The ATMS must support (e.g., add, remove, save) user-selectable and configurable workspaces.			X			Presently iNET allows user to configure and save workspaces. Software Customizations will be required if a user would need to select from multiple workspaces.
4.11	R	The ATMS architecture must not limit the total number of devices that can be concurrently integrated, monitored, and controlled.	X					iNET ATMS fully meets this requirement.
4.12	R	The ATMS must allow Managed Corridor functionality (e.g., Flex route, ATM, ATDM, ICM, VSA, etc.) to be easily applied to other corridors around the State with limited software customizations.		X				Contractor has proven experience in applying Managed corridor functionality to other corridors in the State of Michigan with very little software customizations. iNET Corridor functionality was specifically built for Michigan and in a way so as to easily expand to other corridors in the state through configurations and with none or very little software customizations.
4.13	R	The ATMS must save all data and end all processes upon shutdown.	X					iNET ATMS fully meets this requirement.
4.14	R	In the event of an ATMS failure and without user intervention, upon restart, the ATMS must return to normal operation according to system configuration prior to failure and current time of day. All system failures must be logged and sent to the ATMS manufacturer for analysis and product refinement.	X					iNET already has scripts in place that is in use to restart all the ATMS process for MDOT upon restart without manual intervention.
4.15	R	If the ATMS detects a fatal error within one or more of its processes, it must inform end-user operators in real-time			X			ATMS logs errors when any of its software processes fails. It presently does not send out notifications on those errors to the end user operators. Contractor will develop a watch dog process in the background to monitor the errors in the logs and send notifications to end users

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		via email, by audible and visual alert, and log a message to the system log.						when an error occurs. Various Users group can be set up to be notified of various types of errors. These user group are already configurable within the ATMS.
4.16	R	The ability of the system components (e.g., central server, devices, field communications equipment, other connected field equipment, user workstations, etc.) to interact with each other shall not be governed by a structured start-up order. That is, if a component fails to operate or is powered down, the remainder of the system will operate without interruption and not have to be shut down and restarted to re-establish a working system. The unaffected components will simply wait for the missing component to be returned to the system. When returned, all components will automatically revert to normal operations. This requirement includes but is not limited to the following scenarios: (1) Failure of a device or other connected equipment installed in the field (2) Failure of a user workstation, remote laptop, or mobile device (3) Failure of field communications equipment (e.g., network switch, cellular modem/router, radios) (4) Failure of one or more of the servers for the software and/or database (5) Failure during system maintenance, software upgrade or other hardware, software or infrastructure related issue	X					iNET ATMS fully meets this requirement. No particular order of structured start up required for system components to interact with each other. For eg; If connected equipment goes down, the server need not be started to reestablish connection. Likewise if devices fail, the server will automatically reestablish connections with them when they come back online. The same applies to other system components as well.
4.17	R	The Solution must include a software/hardware watchdog timer (WDT) process to control time critical tasks.			X			All the activities are logged in the ATMS system logs. Contractor will develop a software watchdog to continuously monitor the system logs and flag critical errors immediately upon detection. The System personnel will be notified by the ATMS when these errors occur for immediate attention especially to time critical tasks..

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4.18	R	The ATMS must allow for the implementation of new software components (e.g., firmware, server, etc.) without disruption to the rest of the system.	X					iNET ATMS fully meets this requirement.
5		GUI						
5.1	M	The ATMS must provide a web-based user interface through which users can access system functionality.	X					Meets requirement out of the box
5.2	N/A	The ATMS user interface must provide the following display capabilities:						
5.2.1	R	Ability to manage multiple windows at a single workstation without multiple logins.	X					Meets requirement out of the box. The current iNET ATMS system for Michigan already supports these features.
5.2.2	R	Ability to simultaneously display multiple windows, including multiple map views and multiple table displays, and have tools for window sizing and arranging without distorting the display.	X					Meets requirement out of the box.
5.2.3	R	Ability to monitor and control a device in a separate window (e.g., pop-up) or within the existing window when a device is selected on the map display or through a tabular list.	X					Meets requirement out of the box.
5.2.4	R	Ability to simultaneously monitor and control multiple devices, events, and alerts (e.g., pop-up windows).	X					Meets requirement out of the box.
5.2.5	R	Allow a minimum of 15 display windows to be opened simultaneously without impeding performance.	X					Meets requirement out of the box.
5.2.6	O	Allow a user defined maximum number of display windows to be permitted per user.	X					iNET currently allows admin users to specify number of display windows through system wide configuration in the ATMS GUI.

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5.3	R	The ATMS user interface must provide the ability to select actions and options using multiple actions such as drop downs menus, trees, tables, etc. as well as keyboard entry, mouse scroll wheel, and mouse clicks.	X					Meets requirement out of the box.
5.4	R	The ATMS user interface must provide the ability to configure and view dashboards that display transportation network performance information (e.g., average speeds, speeds per travel lane. stopped/slowed traffic, lane occupancy, incident clearance times, number of active incidents, etc.).		X				iNET ATMS will provide intuitive dashboards that can be configured to view various traffic performance information.
5.5	R	The ATMS user interface must provide the ability to customize and save workstation views and layouts to be used in subsequent sessions.	X					iNET ATMS allows user to customize and save their workstation views and sessions on logout and then retrieve them all during their next login session. This is an out of the box feature of iNET that is already functional in the current MDOT ATMS system.
5.6	R	The ATMS user interface must provide the ability to manage the ATMS configuration including templates, standard reports, and table layouts.	X					iNET ATMS meets the requirement out of the box.
5.7	R	The ATMS must automatically validate input data for free form data fields against syntax, spelling, and banned word rules.	X					iNET ATMS meets the requirement out of the box.
5.8	R	The ATMS must provide standard word processing capabilities within the user interface (e.g. spell check, wrap text, keyboard shortcuts (ctrl-c, ctrl-v, etc.), copy and paste, etc.).	X					iNET ATMS meets the requirement out of the box.
5.9	R	The GUI must provide full-color displays for maps, graphs, displays, commands, and imagery.	X					iNET ATMS meets the requirement out of the box.
5.10	R	The GUI must display devices on the map.	X					iNET ATMS meets the requirement out of the box.
5.11	R	The GUI must provide the ability to navigate to a device's monitoring and control interface by clicking on the device icon within the map.	X					iNET ATMS meets the requirement out of the box.

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5.12	R	The GUI display must remain readable and be responsive on all monitors regardless of screen size.	X					iNET ATMS meets the requirement out of the box.
5.13	R	The ATMS must provide the ability to sort, search, and filter all tabular displays by any column.	X					iNET ATMS meets the requirement out of the box.
5.14	R	The ATMS must provide the ability to filter multiple columns.	X					iNET ATMS meets the requirement out of the box. This is an existing feature in the current iNET ATMS for MDOT
5.15	O	The ATMS should provide the ability to create tabular displays by selecting devices and associated data fields to be included in the tabular display.	X					iNET ATMS meets the requirement out of the box. This is an existing feature in the current iNET ATMS for MDOT
5.16	O	The ATMS should provide the ability to turn off auto refresh when viewing a table with live data.			X			iNET ATMS already has this feature where one can turn on or off auto refresh of live vds data. Customizations will be required to provide this feature in other table views such as DMS messages.
5.17	O	The ATMS should automatically adjust dropdown menus based on the previously selected information. For example, if the user defines the MDOT region, the subsequent County dropdown should only provide counties within the specified region.	X					iNET ATMS meets the requirement out of the box. This is an existing feature in the current iNET ATMS for MDOT.
5.18	R	The GUI must provide a search interface where Traffic Operations Specialists (also referred to as TOC Operator) can filter any tabular display within the ATMS through free text.	X					iNET ATMS meets the requirement out of the box. This is an existing feature in the current iNET ATMS for MDOT
5.19	O	The ATMS should provide the ability to build corridor schematics displaying views of all devices within the corridor limits in a logical layout based on field placement (e.g., west to east). The schematic view should be designed such that overlapping icons can be individually selected without modifying the devices GPS location. The icons must display each device's operational status within the corridor limits.	X					iNET ATM module provides this feature already in the existing ATMS system for MDOT. All the field devices are logically displayed in the corridor schematics based on their placements. The system allows selection of overlapping icons without tweaking the GPS locations and also displays the operational status of them.

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5.19.1	O	The ATMS must provide Traffic Operations Specialists the ability to view current DMS message status for every DMS within a project corridor/group in a single Corridor View window simultaneously (scrolling may be needed if scale and screen size limit legibility).	X					iNET ATM module provides this feature already in the existing ATMS system for MDOT.
5.20	R	The ATMS must provide a mechanism (e.g. ribbon, tool pallet, etc.) to enable more efficient monitoring and control operations by the user.	X					iNET ATMS meets the requirement out of the box. iNET provides switcher bars allowing operators to easily monitor and control across the system.
6		Map						
6.1	R	The ATMS must have a geographically accurate map that displays routes within the state, at a minimum US, I, and M routes .	X					This is an existing feature in the current iNET ATMS for MDOT. No configurations required to meet this requirement.
6.1.1	R	The ATMS Contractor must update the state-approved roads displayed in the Contractor provided base map (base map includes both roadway lines and aerial imagery) semi-annually, or when major updates (i.e., annual version of the Michigan Geographic Framework) have been published.	X					Contractor will continue to update the base maps as before when the updates are provided by the state of Michigan..
6.1.2	O	All ITS elements, events and other data should be able to be overlaid on this map in scale-dependent layers.	X					iNET ATMS fully meets this requirement.
6.2	R	The ATMS map must include the ability to display satellite aerial imagery, as available in commercially supported mapping products, that increases in fidelity as the user zooms in.	X					iNET ATMS fully meets this requirement.
6.3	R	The ATMS map must include intuitive map navigation controls, including a compass if the map can be rotated.	X					iNET ATMS fully meets this requirement.
6.4	R	The ATMS map must have on screen legends that can be toggled on and off.	X					iNET ATMS fully meets this requirement.

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6.5	O	The ATMS map should have an interactive (point and click) distance measurement tool.	X					iNET ATMS fully meets this requirement. It is an existing feature that can be enabled.
6.6	R	The ATMS map must show dual direction highways and directionality of travel if appropriate and when zoomed in to the appropriate level.	X					iNET ATMS fully meets this requirement.
6.7	R	The ATMS map layers (i.e., devices, third-party interfaces, etc.) must refresh real-time status at a user-defined threshold and have the ability to refresh on-demand when requested by a user that is appropriate for that element without causing noticeable latency.	X					iNET ATMS allows authorized user to define these thresholds within the Administration menu on the UI.
6.8	R	The ATMS must provide a help feature for commonly used features/functionality.	X					iNET ATMS fully meets this requirement.
6.9	R	The ATMS must provide the ability to modify lane usage designations, based on lane reductions created by construction and other long-term events.	X					iNET ATMS fully meets this requirement.
6.10	R	The ATMS map must provide the ability to hover over an ITS field device icon on the map and display device information. Contractor to use Column E to provide overview on the device information displayed for each device type.	X					iNET ATMS fully meets this requirement. The following device info is displayed when hovering over the icon of: 1. **DMS (Display Message Signs)**– Current Timestamp, Region, Location Route, DMS ID with name, Status, current message being displayed on the sign 2. **LCS (Lane Control Signs) –** Current Timestamp, Region, Location Route, DMS ID with name, Status, current message being displayed on the sign. 3.**Parking –** Parking Device ID, Location, Cross Street, Status, Number of Available Spaces, Source of Data 4. **VDS (Vehicle Detection System)**- Current Timestamp, Location Route, Description, Status, Speed, Occupancy, Volume. 5. **CCTV (Cameras) –** Region, Location, CCTV ID, Status 6. **ESS (Weather Sensors)** – Region, Location, ESS ID, Status 7. **ATM Corridor** – Current timestamp, Region, Location Route, Corridor ID, Status 8. **ATM Gantry** - Current timestamp, Region, Location Route, Corridor ID, Status 9. **BWTMS(Border Wait Times) –** BWTMS ID, Status, Waittime for Cars, Waittime for Trucks

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6.11	R	The ATMS must allow users to view overlapped icons (e.g., devices and events) and select a single icon when multiple icons are stacked at the same location to display associated information.	X					This feature is present in the existing iNET ATMS for MDOT. Maps allow you to turn on or off the different layers on the map. System also allows you to display certain icons only at certain zoom levels. Contractor can also adjust the offset in the inventory window to spread the multiple icons apart if desired. So, a single icon can be selected from a stack of multiple icons in several ways.
6.12	R	The ATMS must provide the ability to view and navigate maps outside of Michigan, to include at minimum Ohio, Wisconsin, Indiana, Illinois, and Ontario.	X					iNET fully meets this requirement.
6.13	R	The ATMS map must provide the ability to zoom in and view an event.	X					iNET fully meets this requirement.
6.14	N/A	The ATMS map must provide the ability for individual users to configure, save, and recall the following map settings:						
6.14.1	R	Base map selection (e.g., aerial vs roadmap)	X					iNET allows base map selection.
6.14.2	R	Bookmark views for location, zoom level, visible layers, etc.	X					User can create bookmark views within iNET map.
6.14.3	O	View prior to last logout	X					User can save their layout before logging out and retrieve the view on logging back in.
6.14.4	O	Layers (i.e., on vs off)	X					User can toggle layers on and off and save the settings
6.14.5	O	Color scheme (i.e., light vs dark)			X			iNET supports multiple base maps with different styling and themes. iNET presently has themes for GUI but not for the map graphics. If required to include themes for the map graphics, customization will be required.
6.15	O	The ATMS should provide the ability to create a map view on demand by geo-fencing an area (graying out the area outside of the selected area) for use in managing incidents and/or events.			X			Currently in the event viewer and multi viewer, there is a separate map to manage a specific incident. However, Software customizations might be required to allow users to draw a polygon on the map and geo fence it as described in this requirement.

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6.16	R	The ATMS must provide the ability to add commercially available GIS map services such as ESRI REST services (for roadway network and traffic segments), JSON, and GeoJSON to display spatial data sets on top of a map view.		X				iNET provides the flexibility to add any of the commercially available services to display on top of the map view.
6.17	R	The ATMS must provide current device operational status of online, off-line, and disabled through a visual indication.	X					Meets this requirement out of the box. There are corresponding colored icons to visually indicate the status of all devices in the system.
6.18	N/A	The ATMS must provide the ability to configure map settings administratively including the ability to:						
6.18.1	R	Modify device icon placement and rotation of the device in relation to the adjacent roadway (for non-automatically located items)	X					This is out of the box feature. iNET ATMS users with privileges can modify icon placement and rotate devices on the map as needed.
6.18.2	O	Change and configure device icon images	X					iNET ATMS provides the ability to change and configure icons for different purposes.
6.18.3	R	Change and configure device status colors, thresholds, and display characteristics	X					Meets the requirement out of the box.
6.18.4	R	Enable/disable map layers	X					Meets the requirement out of the box.
6.18.5	R	Provide map layers for geographical jurisdictions and state freeway mile markers.	X					Meets the requirement out of the box.
6.18.6	R	Enable/disable third-party mapping layers (e.g., Waze, power outage maps), Contractor to use Column E to provide list of existing third-party mapping layers available		X				Admin has the ability to insert map layers like National weather services etc. Some other layers might require some configuration. Some of the formats iNET supports are WMS, WFS, KMZ, ESRI, XYZ/Tiles. List of existing third-party mapping layers available: Google Traffic, Google services, WAZE, HERE, ESRI Traffic.
6.18.7	R	Enable/disable State of Michigan provided mapping layers.	X					iNET provides the ability to enable and disable the provided mapping layers.
6.19	R	The ATMS must provide the ability to visually differentiate event type and subtype, including severity level of the event, through event icons.	X					There are different kinds of icons with various coloring scheme displayed on the map to visually differentiate between various event types, subtypes, severity etc. This is an out of the box feature.
6.20	R	The ATMS must visually represent the extents of construction events (line and point-based) on the map.	X					Out of the box feature

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6.21	R	The ATMS must include a map layer for future planned events.		X				A separate map layer will be added for just the future planned events. They will appear on the legend with its own icons that can be turned on or off like other existing layers.
6.22	R	The ATMS must provide the following speed layers:	X					iNET ATMS meets this requirement. The current iNET ATMS system for MDOT is already configured for displaying speed layers on the map.
6.22.1	R	Speed layer based on ingested probe data provided by the State through a separate contract.	X					iNET ATMS meets this requirement. Already configured in the current iNET ATMS system
6.22.2	R	Speed layer based on the State's vehicle detection systems.	X					iNET ATMS meets this requirement. Already configured in the current iNET ATMS system
6.23	R	The ATMS speed layer must be color coded based on speed thresholds that are system configurable based on deviation from the roadway's speed limit.	X					iNET ATMS meets this requirement. Already configured in the current iNET ATMS system
6.23.1	O	The ATMS speed layer should be color coded based on speed thresholds that are system configurable based on deviation from historical average speeds.		X				In the current iNET ATMS, Speed layer is color coded based on speed thresholds that are part of system configurations. System Administrator must manually specify these thresholds in the speed configuration screen based on the known deviation from historical average speed.
B		Field Devices						
7		Field Device (General)						
7.1	R	The ATMS must continuously communicate with ITS field devices at a State-defined and configurable frequency, with a default of once per minute, to determine the current status of online since a configurable timeout threshold, off-line, and disabled.	X					iNET ATMS meets this requirement. The current iNET ATMS for MDOT is already configured for this.
7.2	R	The ATMS must provide the ability to set a field device as online or disabled.	X					iNET ATMS fully meets this requirement.
7.3	R	The ATMS must be able to designate field devices as retired that are no longer in use.	X					iNET ATMS fully meets this requirement.

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7.4	R	The ATMS must maintain the history of field devices and their status changes in the system in accordance with MDOT's ITS/TOC Retention Schedule.	X					The history of field devices and their status changes are archived in the ATMS Archive database. This is already a feature in the current MDOT iNET ATMS system.
7.5	R	The ATMS must be capable of receiving communication and issuing commands to all field devices under system control.	X					iNET ATMS fully meets this requirement.
7.6	R	The ATMS must integrate with all features of the devices listed in the Statement of Work. Functionality of the device must not be limited by the ATMS.	X					iNET ATMS fully meets this requirement.
7.7	R	The ATMS must provide the ability to assign each device to multiple geographical areas including, but not limited to TOC coverage area, MDOT Region, and Michigan Jurisdiction (County and City).	X					Each device can be assigned to multiple device groups from multiple geographical areas within iNET ATMS.
7.8	N/A	The ATMS must provide, at a minimum, the following device information when requested via the user interface:						
7.8.1	R	Location: route, direction (e.g., north, etc.), milepost, GPS coordinates	X					iNET ATMS fully meets this requirement.
7.8.2	R	ID number	X					iNET ATMS fully meets this requirement.
7.8.3	R	IP address	X					iNET ATMS fully meets this requirement.
7.8.4	R	Make and model	X					iNET ATMS fully meets this requirement.
7.8.5	R	Real-time status	X					iNET ATMS fully meets this requirement.
7.8.6	R	Time or duration since the last real-time status update	X					iNET ATMS fully meets this requirement.
7.9	R	The ATMS user interface must provide the ability to select a device from a table, list, and map icon to control the device, expose the device details, enter/edit the device data and obtain real-time information being transmitted by a field device.	X					iNET ATMS fully meets this requirement. The current iNET ATMS for MDOT is already configured to provide all of the said features.

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7.10	R	The ATMS user interface must provide the ability to filter field device icons by type, subtype, designated favorites, and a metric for frequently used devices (e.g., number of times accessed, duration of time the device was actively in use).			X			iNET ATMS currently allow filtering field device icons by type and subtype, Software will be enhanced to extend this feature to also include criteria such as designated favorites, number of times accessed, duration of active usage etc. Enhancements will include front end changes as well as supporting backend changes to include all these additional fields to be included in the filter criteria..
7.11	R	The system must be robust to partial data outages and must continue to operate when some data sources are not available. For example, if the temperature sensor at a remote site fails, the ATMS must continue processing all other available sensor data at the site, such as pavement condition. The ATMS must continue to provide response plan recommendations during partial data outages.	X					iNET ATMS fully meets this requirement. ATMS will continue to function even when there is partial data outages.
8		Dynamic Message Signs (DMS)						
8.1	R	The ATMS must provide the ability to manage dynamic message signs (DMS) which include large displays, small displays, portable changeable message signs (PCMS), lane control sign (LCS), dynamic display panels (DDP), travel time signs (TTS), dynamic parking signs (DPS), blank out signs (BOS), and DMS modules embedded in static signs such as trailblazer signs.	X					iNET ATMS fully meets this requirement. The current iNET ATMS for MDOT is already configured to provide the ability to manage all of the types of signs mentioned in this requirement.
8.2	R	The ATMS must be able to support Traffic Operations Specialists to fit and adjust message content on DMS of various sizes.	X					iNET ATMS fully meets this requirement.
8.3	R	The ATMS must have the capability to assign and modify font types and sizes for each DMS type (e.g., small, large, color).	X					iNET ATMS fully meets this requirement
8.4	R	The ATMS must provide an alert if a proposed message will not fit on the designated DMS prior to saving.	X					iNET ATMS fully meets this requirement

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8.5	R	The ATMS must verify the number of characters are appropriate for a given sign type and sign location.	X					iNET ATMS fully meets this requirement
8.6	R	The ATMS must provide DMS what you see is what you get (WYSIWYG) interface for viewing proposed and deployed messages.	X					iNET ATMS fully meets this requirement
8.7	R	The ATMS must be capable of posting messages on both full-color DMS and monochrome (amber) DMS.	X					iNET ATMS fully meets this requirement
8.8	R	The ATMS must provide the ability to retrieve and cache font types and sizes from a DMS and select from retrieved font types and sizes for use in developing messages to send to the subject DMS.	X					iNET ATMS fully meets this requirement
8.9	R	The ATMS must provide the ability to import full-color graphics and imagery that is consistent with the Manual on Uniform Traffic Control Devices (MUTCD), current edition, symbols and incorporate them into the DMS message display using the system's message creation dialogue, when the DMS device allows it.	X					iNET ATMS fully meets this requirement
8.10	R	The ATMS must provide the ability to display graphics and symbols with static or variable full color text, when the DMS allows it.	X					iNET ATMS fully meets this requirement
8.11	R	The ATMS must store graphics and symbols in a standard message library.	X					iNET ATMS fully meets this requirement
8.12	R	The ATMS must be able to create and send graphical messages for immediate display on DMS and for storage in DMS controllers. The ATMS must recall and display stored messages upon request from a Traffic Operations Specialist or as part of a response plan.	X					iNET ATMS fully meets this requirement
8.13	R	The ATMS must be capable of displaying both graphic and text (side-by-side) on a single page message and separated on a multi-page (two-phase) message.	X					iNET ATMS fully meets this requirement. The current iNET ATMS system for MDOT already provides this capability mentioned in the requirement.

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		Per MDOT's messaging guidelines, multi-page is posting two individual messages in a repeating and alternating fashion at a user-defined interval.						
8.14	N/A	The ATMS must be capable of displaying the following graphic types on compatible DMS:						
8.14.1	R	Static graphics, which may include, but not be limited to, MUTCD sign images.	X					iNET ATMS fully meets this requirement
8.14.2	R	Dynamic graphics, which may include, but not be limited to speed warning sign images with changing numbers.	X					iNET ATMS fully meets this requirement.
8.15	R	The ATMS must be capable of combining two single page messages (manual and/or automated messages at the same or varying priority levels) into multi-page messages on a single DMS but maintain each single messages assigned priority.	X					iNET ATMS fully meets this requirement. The current iNET ATMS for MDOT already provides this feature through its DMS Message concatenation capability.
8.16	R	The ATMS must be capable of assigning specific message types to auto-concatenate into a multi-page message based on the DMS message queue and priority. Concatenation requirements are located within MDOT's Messaging Guidelines where concatenation is defined when two separate DMS messages are programmed to display in a repeating and alternating fashion (i.e., multi-page message). For example, message 1 = Travel Times and message 2 = weather advisory.	X					iNET ATMS fully meets this requirement. The current iNET ATMS for MDOT already has the Auto Message concatenation feature.
8.17	R	The ATMS must provide the ability to verify which active messages are auto-concatenating.	X					iNET ATMS fully meets this requirement. DMS viewer will allow the users to verify this information about which active messages are auto concatenating..

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8.18	R	The ATMS must provide the ability to activate/deactivate concatenation between messages for an individual DMS without resetting message priorities.	X					iNET ATMS fully meets this requirement. iNET ATMS provides this ability on the DMS viewer.
8.19	R	The ATMS must organize DMS message libraries into groups (e.g., MDOT Region, corridors, roadway, etc.).		X				iNET ATMS allows grouping of message libraries. The Message library is very flexible that can be configured into any number of groups that MDOT wishes including grouping by MDOT Regions, corridors, roadway etc.
8.20	R	The ATMS must provide the ability to create, edit, save, import, and export messages in the ATMS's message library.	X					iNET ATMS fully meets this requirement. iNET provides a very easy and intuitive way of performing all of the functionality in this requirement.
8.21	R	The ATMS must provide the ability to manually adjust the brightness of a DMS on devices that provide such functionality.	X					iNET ATMS fully meets this requirement. Brightness can be manually adjusted through the ATMS GUI.
8.22	R	The ATMS must include an inappropriate word filter in the spelling library for DMS messages. The word filter must be configurable by an authorized user.	X					iNET ATMS fully meets this requirement.
8.23	R	The ATMS must allow manual blanking of each DMS. This feature must be capable of overriding any automatic messages. The software must blank signs using the NTCIP command for blanking; a “no text” command must not be used.	X					iNET ATMS fully meets this requirement
8.24	N/A	The ATMS must provide the following functionality for PCMS:						
8.24.1	O	View PCMS health status such as pixel failures and the battery level	X					iNET ATMS fully meets this requirement. Users can run DMS Diagnostics from the ATMS GUI.
8.24.2	O	Automatically update location based on GPS of the PCMS unit		X				The current iNET system for MDOT was already configured to perform this functionality. Additional configurations might be required for new PCMS units that are being added. .
8.24.3	O	Manually override the location of a PCMS unit	X					iNET fully meets this requirement.

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8.25	R	The ATMS must be capable of showing what message is activated on a BOS.	X					iNET fully meets this requirement.
8.26	R	The ATMS must record BOS activations and deactivations including location, roadway direction, date, time, and condition triggering the activation/deactivation.	X					iNET fully meets this requirement.
8.27	O	The ATMS should provide the ability to communicate and authenticate messages to a DMS through an API and through a Contractor owned back-end interface.	X					iNET fully meets this requirement. REST APIs are available within iNET for communication and authenticating messages to DMS signs.
9		CCTV (temporary and permanent)						
9.1	R	The ATMS must provide the ability to manage State approved NTCIP-compliant CCTV cameras.	X					iNET fully meets this requirement.
9.2	R	The ATMS must provide the ability to configure, select, pan, tilt, zoom, view, and focus fixed and portable CCTV cameras including:	X					iNET fully meets this requirement.
9.2.1	R	Multiple simultaneous viewing of a single camera's live video stream by multiple users	X					iNET fully meets this requirement.
9.2.2	R	Manage the layout and window size of multiple video streams in the user interface	X					iNET fully meets this requirement.
9.2.3	R	Viewing a minimum of six multiple video streams at a single workstation	X					iNET fully meets this requirement.
9.2.4	R	Tile images from multiple camera feeds in a separate window to create a virtual video wall with drag-and-drop capability	X					iNET fully meets this requirement. Multi viewer window capability within iNET allows the users to create a virtual video wall with drag and drop capability.
9.2.5	R	Remove an image from a virtual video wall without having to replace it	X					iNET fully meets this requirement.
9.2.6	R	Assign camera presets (user defined zoom level and viewing direction stored in system memory).	X					iNET fully meets this requirement. There are already user defined presets configured and stored in the current iNET ATMS system for MDOT.
9.2.7	R	Customization of video tours to include any number of cameras and camera presets (tours actuate sequencing through defined camera presets)	X					iNET fully meets this requirement. Video tours are already configured and stored int he current iNET ATMS system for MDOT.

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9.2.8	O	Continuously sequencing a CCTV camera through user-defined camera presets.	X					iNET ATMS fully meets this requirement. It provides the ability to continuously run tours.
9.2.9	R	Full screen or windowing of full motion video with ability to pan, tilt, and zoom	X					The current iNET ATMS for MDOT has full screen or windowing of full motion video. However, the PTZ controls was not available within the same full screen. iNET Team is presently working on adding the PTZ control feature within the screen and will be completed very soon. This will be an out of the box iNET feature
9.3	N/A	Contractor to identify the method(s) available for a Traffic Operations Specialist to pan and tilt a CCTV.						
9.3.1	O	The States preference is to pan and tilt a CCTV through clicking and dragging a cursor on the screen.	X					iNET ATMS fully meets this requirement with its onscreen PTZ feature.
9.3.2	R	The ATMS must not prevent or limit the movement (pan and tilt) functionality of the camera.	X					iNET ATMS fully meets this requirement. There is no limitations in the movement functionality of the camera.
9.4	R	The ATMS must have a configurable scheduled preset capability which can be adjusted by time-of-day and day-of-week.	X					iNET ATMS fully meets this requirement.
9.5	R	The ATMS must have the ability to provide control for optical and digital zoom for cameras that support zoom capabilities. Contractor to identify the method(s) available for a Traffic Operations Specialist to zoom a CCTV.	X					iNET ATMS fully meets this requirement. It provides control for optic and digital zoom for cameras with those capabilities.
9.5.1	O	The States preference is to zoom a CCTV using the mouse scroll wheel.	X					iNET ATMS fully meets this requirement.
9.6	R	The ATMS must have the ability to provide IRIS control on cameras that support an adjustable IRIS capability.	X					iNET ATMS fully meets this requirement.
9.7	R	The ATMS must identify, store, and display the user that last moved a camera, including the date and time.	X					iNET ATMS fully meets this requirement.

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9.8	R	The ATMS must provide the ability to save virtual video wall layouts as favorites which can be accessible locally to the individual user as well as globally for any user.			X			Customizations will be made for users to save virtual video layouts as favorites and add it to a list of favorites. A drop down will created showing list of favorites created by all users in the system. This will be a global list that any user can select from the drop down and use that virtual video wall layout.
9.9	O	The ATMS should provide the ability to take and save snapshots from video feeds or camera layouts to a database accessible to all users.	X					iNET ATMS fully meets this requirement.
9.9.1	O	The ATMS should provide the ability to export a snapshot to an email, text, tweet, or other communication medium.	X					iNET ATMS currently allows users to save a snapshot from the ATMS to any folder in their PC machine. The user can then attach the snapshot to an email, a text, tweet etc. from that folder. This is a simple and cost-effective way of meeting this requirement. There are also ways to attach snapshot directly from ATMS to email and send. However, sending snapshots as Text from PCs can be a bit intricate and it might not be cost beneficial to do that. During the requirements walk through phase, Contractor can discuss this further with the client and work out the best option for the State.
9.10	O	The ATMS should be able to record and archive CCTV camera streaming video of a rolling or continuous user defined period.			X			Customizations will be made to record and archive video streaming on the wowza server. There will be a record and Pause button provided on the video viewer UI. The recorded video will be stored on the video server for a certain time period. The exact duration of time the recorded videos must be stored can be discussed during the requirements walk through.
9.11	N/A	The ATMS must provide the following functionality for portable CCTV cameras:						
9.11.1	O	Automatically update location based on GPS of the portable CCTV unit	X					iNET ATMS fully meets this requirement.
9.11.2	O	Manually override the location of a portable CCTV unit.	X					iNET ATMS fully meets this requirement.
9.12	R	The ATMS must not prohibit the user to view CCTV cameras at any time (i.e., acknowledging a system prompt should not prohibit the use of a CCTV prior to accepting or dismissing the prompt).	X					iNET ATMS fully meets this requirement.

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9.13	O	The ATMS should have the ability to display video processed from other State systems, such as traffic signal and ESS CCTV cameras.		X				iNET ATMS has the capability to process video from other state systems and display. Some configuration will be required depending on the type of the video, network etc.
9.14	R	The ATMS must provide the ability to lock and release control of controllable CCTV cameras.	X					iNET ATMS fully meets this requirement.
9.15	O	The ATMS must provide a means of identifying if a CCTV camera is being transmitted via cellular modem.			X			Software Customizations will be made to allow user to indicate if a camera is transmitting via a cellular modem. The user can select a checkbox for cellular modem in the CCTV inventory screen and save. The CCTV will have a visual cue on the List and Viewer to indicate that this is a camera via a cellular modem.
10		Environmental Sensor Stations (ESS)						Currently provided by TerraForm Manager (Mixon Hill)
10.1	O	ESS are currently managed through the State's Weather Feed. Contractor to indicate if their ATMS solution has the capability of integrating ESS and associated sensors via NTCIP 1204.	X					iNET ATMS fully meets this requirement. it already has an interface with Mixon Hill in place for MDOT.
11		Vehicle Detection Systems						
11.1	N/A	The ATMS must provide the ability to add, remove, modify, disable, and manage vehicles detectors, including but not limited to the following:						
11.1.1	R	Microwave vehicle detection system (MVDS)	X					iNET ATMS fully meets this requirement.
11.1.2	O	Video	X					iNET ATMS fully meets this requirement.
11.1.3	O	Inductive loop	X					iNET ATMS fully meets this requirement.
11.1.4	O	In-Pavement Wireless detector	X					iNET ATMS fully meets this requirement.
11.2	R	The microwave vehicle detection system (MVDS) driver must be compatible with MVDS currently operated by the State, including Wavetronix and RTMS G4.	X					iNET ATMS fully meets this requirement.
11.3	N/A	The ATMS must capture and be capable of displaying the following vehicle data over a user-defined duration in each direction at vehicle detector locations:						

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11.3.1	R	Average speed of all lanes	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.3.2	R	Average speed of each individual lane	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.3.3	R	Cumulative traffic volumes of all lanes	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.3.4	R	Cumulative traffic volumes of each individual lane	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.3.5	R	Lane occupancy of all lanes	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.3.6	R	Lane occupancy of each individual lane	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.3.7	R	Vehicle classification of all lanes	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.3.8	R	Vehicle classification of each individual lane	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.4	R	The ATMS must store time-stamped traffic data collected by the sensor/detectors, by lane, including speed, volume, occupancy, classification, and travel time, according to the capability of the sensor(s) for a length of time that is defined by the MDOT ITS/TOC Retention Schedule.	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.
11.5	R	The ATMS must be capable of assigning a label to each lane with data being collected by a vehicle detection	X					iNET ATMS fully meets this requirement. All of these data are archived and can be retrieved at any time. All these information can be displayed through iNET reports for any user defined timeline.

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		system, such as Mainline Lane 1, Mainline Lane 2, System Ramp, Ramp.						
11.6	R	The ATMS must provide the capability to use the following vehicle detector data in its algorithms used to automate system actions.	X					The iNET VDS module uses the VDS data including near real time data of Speed, Volume and Occupancy in its complex algorithms to determine accurate traffic conditions and automate system actions. This requirement is fully met by iNET ATMS.
11.6.1	R	Near real-time speed	X					iNET ATMS fully meets this requirement.
11.6.2	R	Near real-time volume	X					iNET ATMS fully meets this requirement.
11.6.3	R	Near real-time lane occupancy	X					iNET ATMS fully meets this requirement.
11.7	O	The ATMS should be capable of automatically performing data validation checks (e.g., missing data, anomalies, erratic, etc.) for MVDS. If data does not meet quality pre-defined thresholds, sensor data should be flagged as failed and removed from the algorithm until data quality improves, at which time is included back into the algorithm.	X					iNET ATMS fully meets this requirement. There is a Failure management process that runs within iNET and validates the data being collected for anomalies, missing data etc. Bad quality data will be flagged and excluded from the VDS algorithms until they improve and meets the quality thresholds.
11.8	O	The ATMS should provide the ability to manually flag suspect vehicle detection devices and data.			X			iNET ATMS has a failure management process that will automatically flag suspect devices and data. However, ATMS currently does not provide the ability to accept manual flagging of suspect device or data. Software will be customized to allow this feature so that authorized ATMS users can manually flag suspect device and data. The new custom software will then have a hybrid solution to flagging suspect data – one automatically flagged by the ATMS and the other manually flagged by the user.
11.9	O	The ATMS should provide a mechanism for users to exclude suspect flagged vehicle detector data from historical reports, analysis, and decision-making without deleting the data. If a user does not choose to exclude the suspect data, it should be included in the report.			X			Software customizations will be made to meet this requirement. The suspect data will continue to be archived and stored in the database as before. Code Modifications will be made for user to specify whether or not through the GUI, the flagged suspect data will be included in the reports, analysis or decision making. These are simple code modifications with no risk impact of any sort.
11.10	O	The ATMS should provide a clear indication when historical or interpolated vehicle detector			X			Software modifications will be made to clearly identify the historical or interpolated vds data and the associated malfunctioning sensors. The code modifications will have no risk bearing whatsoever.

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		data is used in order to easily identify the malfunctioning sensors for maintenance.						
11.11	O	The ATMS system should graphically display the lanes being detected along with lane-by-lane identifiers at each vehicle detector location that aligns with report outputs.			X			Software modifications will be made to meet these requirements as well. There will be a modified VDS viewer within iNET GUI that will cleanly display the lanes being detected along with lane-by-lane identifiers at every VDS location (and aligning with reports). No risk impact with these code modifications.
11.12	O	The ATMS should capture and display wrong way driving detection events detected by vehicle detection systems, by direction and lane for of all lanes in each direction at vehicle detector locations.			X			Software customizations will be required to meet this requirement. This has been implemented for a different client. Any software customizations will try to leverage some of the previously developed code.
C		Operations						
12		Response Plans						
12.1	R	The ATMS must incorporate approximately 1,100 previously developed State response plans. The ATMS must not limit the number of response plans that can be added.	X					iNET ATMS fully meets this requirement. Response plans are already configured in the current ATMS system. No limits to number of response plans that can be added.
12.2	R	The ATMS must provide the ability for a TOC Traffic Operations Specialist to approve, decline, or modify recommended response plans.	X					iNET ATMS provides total ability to approve, decline or modify Response Plans within the system.
12.3	R	The ATMS must provide the ability to administratively add, delete, update and manage business rules (e.g., alerting based on data values exceeding a threshold, automated responses to detected incidents).	X					iNET ATMS provides all capabilities for ATMS administrators to add/update/delete/manage business rules within the ATMS through its GUI.
12.4	R	The ATMS must be configurable to allow an authorized user to toggle automated responses between the following two operational modes: (1) automatically implement a recommended response plan with no human interaction and (2) require TOC Traffic Operations Specialist verification (e.g., pop up alert).	X					The system as it currently stands allows for the auto response to be selected, in which device based responses and planned event responses can be set to automatically be implemented or require an operator to verify before implementing the response.

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12.5	R	The ATMS must identify if a device within a response plan is disabled or offline.	X					iNET ATMS fully meets this requirement. Only active devices will be allowed to be selected by users from the list for activating response plans.
12.6	N/A	The ATMS must perform the following functions when a disabled or offline device is included in a response plan:						
12.6.1	R	A message included in a response plan should be added to the sign queue for the duration of the response plan.	X					iNET ATMS fully meets this requirement.
12.6.2	R	If an offline device becomes online during an active response plan the ATMS must post the queued message.	X					iNET ATMS fully meets this requirement.
12.6.3	R	When the response plan ends, all messages related to the response plan must be removed from the sign queue regardless of device status.	X					iNET ATMS fully meets this requirement.
12.7	R	The ATMS must allow a response plan to use any type of device, such as posting a message to a DMS, and repositioning a CCTV camera).			X			Response plans in iNET currently allows posting a message to DMS, sending out user notifications, listing the nearest CCTVs for viewing etc. However, minor code enhancements will be required to move a CCTV to a particular preset as part of the response plan.. No risk impact with the required code changes.
12.8	R	The ATMS must provide the ability to specify any number of DMS to receive a given message.	X					iNET ATMS does not provide any restriction in number of DMS to which messages can be posted.
12.9	R	The appropriate number of DMS in a response plan must be automatically determined by the ATMS based on the geographic extent and severity of the incident, ranging from a single DMS to all DMS in a group, corridor, or route.	X					As specified exactly in this requirement , DMS signs to be included in the Response plans are determined by the iNET ATMS based on their distance from the incident and the severity of the incident.
12.10	R	The ATMS must be capable of differentiating at grade and grade separated intersections when generating response plans and other automated system functionality.			X			Code enhancements will be made within iNET ATMS to distinguish at grade and grade separated intersections during the generation of response plans and other automated system functions. No risk impact with the required code changes to meet this requirement..
12.11	R	The ATMS must provide the ability to post a message to multiple DMS at the same time even if one or more DMS in the group are off-line.	X					iNET ATMS fully meets this requirement.
12.12	R	The ATMS must automatically adjust a response plan if a user removes one or more DMS from a response plan.	X					iNET ATMS fully meets this requirement.

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		If a response is active it shall not be terminated during this process.						
12.13	R	The ATMS must provide the ability to simultaneously remove a message from more than one DMS at the same time.	X					iNET ATMS fully meets this requirement.
12.14	R	The ATMS must have the ability of storing DMS traffic management plans, including symbols and graphics. The plans may include one or more DMS, each with specific, unique messages.	X					iNET ATMS fully meets this requirement. ATMS stores DMS Traffic management plans in a library that can be retrieved anytime by authorized users.
12.15	R	The ATMS must have the ability of referencing each DMS plan to specified roadway segments and the directionality of that roadway segment.	X					iNET ATMS fully meets this requirement. The authorized ATMS users can pull up the plan from the library and apply it to any scpr
12.16	R	The ATMS must have the ability of scheduling messages to be posted and removed on individual or a group of DMS with full recurrence capabilities in typical scheduling functions such as time of day (TOD), day of week (DOW), day of month (DOM), day of year (DOY), and holidays.		X				iNET ATMS has ability to schedule messages and post it to individual or group of signs with recurrence capabilities. Configuration will be required for scheduling recurrence for day of month, day of year and holidays.
12.17	R	The ATMS scheduling function must allow for multiple DMS schedules (e.g., initiation of message, duration, return to default, etc.) to be stored.	X					iNET ATMS fully meets this requirement.
12.18	R	The ATMS must have a message prioritization ability, complying with the MDOT DMS Messaging Guidelines, which applies to individual messages, scheduled messages and message plans.	X					iNET ATMS fully meets this requirement.
12.19	R	The ATMS must utilize prioritization logic (configurable by an authorized user) to reconcile conflicting messages arising from multiple events, or rule-based response based on the priority of the corresponding event or DMS message.	X					iNET ATMS DMS module has ability to send and prioritize messages on various queue levels.
12.20	R	The ATMS must have the ability to auto-select devices to be included as part of a response plan based on	X					iNET ATMS has the capability to auto select devices based on the location of the event and the location of the devices based on the proximity.

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		roadway classification and the linear proximity from an event.						
12.21	R	The ATMS must be able to determine which signs are relevant to a given incident based on analyzing connecting routes and incident severity when determining message plans.	X					iNET ATMS has this as a current capability from the Response Plan Module
12.22	R	The ATMS must provide the capability to configure DMS message templates to be used by the ATMS to generate response plan items for an event.	X					iNET ATMS has the ability to store Library Response Plan and use the selected Library response plan to associate with an event.
12.23	R	The ATMS must provide the capability to configure DMS message templates with static text and variables with the text that will be populated with information from an event during operations.	X					iNET ATMS has this as a current capability from the Response Plan Module
12.24	R	The ATMS must provide the capability to configure response plan item templates with attributes including event type, route relation (i.e., on-route, off-route).	X					iNET ATMS has this as a current capability from the Response Plan Module
12.25	R	The ATMS must be capable of generating response plans using attributes from multiple templates matching the event (e.g., incident within a work zone).	X					iNET ATMS has this as a current capability from the Response Plan Module
12.26	R	The ATMS must provide the capability of developing, modifying, and storing comparison and logical operator-based response plans (e.g., if x is less than or equal to y then perform z, if x happens perform y).	X					iNET ATMS provides these capabilities from the Automatic Response Plan module
12.26.1	R	Comparison- and Logical-based response plans must be capable of adding geo-fenced parameters.	X					iNET ATMS provides this capability using the Location based response plan and Automatic Response plan.
12.26.2	R	Multiple comparison- and logical-based response plans must be capable of being combined using “AND” and “OR” statements (e.g., Display message x if it is morning “AND” speeds drop below 35mph “OR” if route y travel time is less than z). The ATMS must provide the ability to group multiple statements and follow a standard order of assessment.	X					iNET ATMS provides these capabilities from the Automatic Response Plan module. User can add multiple levels of comparison using logical operators

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12.27	R	The ATMS must provide the ability for response plans to be assigned by geographical coverage area (i.e., MDOT Region).	X					iNET ATMS provides this capability using the Location based response plan and Automatic Response plan.
12.27.1	O	The ATMS should auto-filter available response plans by geographical coverage area (i.e., MDOT Region).	X					iNET ATMS provides this capability using the Location based response plan and Automatic Response plan.
12.28	R	The ATMS must provide the ability to search pre-defined response plans by matching a free-form text input phrase such as a highway name or event type.			X			This is currently not an iNET feature. Software customizations will be made to enable the search based on free text messages and find a close match to the message in the response plan library..
12.29	R	The ATMS must generate suggested response plans based on the attributes of an automated and manually entered event.	X					iNET ATMS fully meets this requirement.
12.29.1	R	The ATMS must generate suggested response plan updates when the interim status of the event that initiated the response plan changes, not including event termination.	X					The current iNET ATMS implementation – for any event updates and for the corresponding response plan updates, the user can update the details and regenerate the response plan .
12.29.2	R	The ATMS must automatically terminate the response plan messages (active and queued) when an event that the response plan is associated with is terminated.	X					iNET ATMS fully meets this requirement.
12.30	R	The ATMS must be capable of displaying graphics with the ability for the speed, travel times, distance to back of queue, or other information to be updated/changed based on polled ATMS data, which may include sources such as VDS, ESS, probe data, external systems, data feeds, and Traffic Operations Specialist entered information.	X					iNET ATMS fully meets this requirement.
12.31	R	The ATMS must be capable of displaying text with the ability for the speed, travel times, distance to back of queue, or other information to be updated/changed based on polled ATMS data, which may include sources such as VDS, ESS, probe data, external systems, data	X					iNET ATMS fully meets this requirement.

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		feeds, and Traffic Operations Specialist entered information.						
12.32	R	The ATMS must generate suggested response plans when user-defined weather conditions are identified and will affect an event based upon user defined thresholds (jurisdiction specific) or jurisdictional control.	X					iNET ATMS provides this capability using the Location based response plan and Automatic Response plan.
12.33	R	The ATMS must allow a TOC Traffic Operations Specialist to manually override message(s) within a predefined response plan. ATMS must not post any response plan messages to the subject sign until the manual override is removed.	X					iNET ATMS provides this capability using the 'Override' queue level
12.34	R	ATMS must be capable of recommending response plans associated with multiple events occurring simultaneously, such as adverse weather and incidents. Response plan recommendations must be consistent with the State's message priority.	X					iNET ATMS fully meets this requirement.
12.35	R	The ATMS must include response plan messages based on condition and/or length of expected impact. Condition may include icy roads, low visibility, etc.; event may include adverse weather, etc.; and length should define how long the condition and/or event is present (e.g., next yy miles).	X					iNET ATMS provides this capability using the Response Plan module and Advanced Traffic Management (ATM) corridors.
12.36	R	The ATMS must have the ability of creating and storing multiple pre-defined response plans and pre-defined DMS plans with a configurable template to populate a planned event. For example, a pre-defined response plan for a road closure should deploy the associated pre-defined response plan for that location, which takes into account posting pre-defined messages to upstream DMS and utilizes applicable devices within the subject response plan.	X					iNET ATMS fully meets this requirement.
12.37	R	The ATMS must have the ability of scheduling and implementing pre-defined response plans for one-time	X					iNET ATMS provides this capability of sending scheduled response plan for recurring events.

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		or recurring planned events for any State roadway segment in Michigan.						
12.38	R	The ATMS must provide the ability to auto generate response plans based on device data utilizing a predefined message library that takes into account device location.	X					iNET ATMS fully meets this requirement.
12.39	R	The ATMS must auto-generate suggested response plans when changes in travel conditions are identified based upon user defined thresholds.	X					iNET ATMS fully meets this requirement.
12.40	R	The ATMS must generate suggested response plans when an increase in the geographic range of impact of a verified incident occurs (impact extent defined by incident duration and traffic congestion).	X					iNET ATMS fully meets this requirement.
12.41	R	The ATMS must provide the ability to assign a timeout to a response plan which would remove the response plan from any DMS queue if not posted within a user-configurable timeout duration.	X					iNET ATMS provides the ability to auto terminate events and the associated response plans for scheduled events.
12.42	R	The ATMS must auto-generate suggested response plans when changes in weather conditions are identified based on a dynamic polygon identifying weather attributes provided through the State's weather feed.	X					iNET ATMS provides this capability using the Area weather feed.
12.43	R	The ATMS must provide the ability to add and remove devices from an auto-generated response plan based on being located within the limits of a dynamic polygon provided through the State's weather feed.	X					iNETATMS fully meets this requirement.
12.44	R	The ATMS must auto-generate suggested responses based on real-time weather notifications provided by NWS. Automated responses may include DMS messaging, CCTV camera preset, variable speed advisory, etc.		X				This can be achieved through system configurations. ATMS will create event based on notifications from the NWS feed. Response plans can then be automatically generated based on these NWS event types and activated. The associated response plan that gets activated here can be preconfigured to include appropriate DMS messaging, CCTV camera presets, VSA advisory etc..
12.45	R	The ATMS must provide the ability to adjust automated responses from the NWS based on the weather notification attributes.		X				Configurations must be made to adjust responses based on weather notification attributes from NWS.

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12.46	R	The ATMS must adjust a proposed response plan to account for failed Flex Route devices when recommending and activating a response plan. For example, if a gantry is offline, the ATMS must adjust the response plan to push the appropriate messaging to an upstream gantry, if available.	X					iNET ATMS fully meets this requirement.
12.47	N/A	A VSA response plan must include the physical start and end limits of the event based on the local area of influence from the following near real-time data: weather polygon data and the local area of influence from ESS data.						
12.47.1	R	Vehicle detectors (vehicle speeds, lane occupancy)	X					iNET ATMS fully meets this requirement.
12.47.2	R	ESS data (pavement and atmospheric)	X					iNET ATMS fully meets this requirement.
12.47.3	R	Weather polygon data	X					iNET ATMS fully meets this requirement.
12.48	R	A response plan to de-activate VSA messages must be confirmed by a Traffic Operations Specialist. Once de-activated, the ATMS must return the DMS and/or LCS to normal operations.	X					iNET ATMS fully meets this requirement.
12.49	R	When the VSA is active and the ATMS is no longer able to make a speed recommendation for any reason, the respective DMS(s) must default to the next message in the ATMS queue.	X					iNET ATMS fully meets this requirement.
12.50	R	Response plans recommended by the ATMS must have the ability to include a VSA speed and advisory message (text and graphic side by side) on one page and supplemental messages on another page if speed, road, and/or weather condition thresholds are met. Supplemental messages refer to travel times or text and graphic side by side.	X					iNET ATMS provides this capability using auto concatenation and ATM VSL modules.
12.51	R	The Traffic Operations Specialist must be allowed to set a DMS to concatenate VSA messages with the next	X					iNET ATMS fully meets this requirement.

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		highest single-page message instead of Travel Times on a sign by sign basis.						
12.52	R	The Traffic Operations Specialist must be allowed to set a DMS to concatenate single page VSA messages with Travel Time messages on a sign by sign basis.	X					iNET ATMS provides this capability using auto concatenation and ATM VSL modules.
12.53	R	The Traffic Operations Specialists must be able to select travel time template targets to be stored in association with a response (e.g., preferred vs. alternate route).	X					iNET ATMS provides this capability using the Travel time modules – alternate TT templates.
12.54	R	The ATMS must allow an approved user to set up device based response parameters based on: - Average vehicle detector speeds, volumes or occupancies (if provided by the vehicle detector) - Individual lane speeds, volumes or occupancies (if provided by the vehicle detector) - ESS Station data (via the Weather Feed) - Travel Times above set parameters for current defined travel time segments	X					iNET ATMS fully meets this requirement.
12.55	R	From the Weather Feed, the ATMS must determine which devices to include in the weather event along the corridor and recommend when to activate and deactivate pre-defined response plans based user-definable thresholds.	X					iNET ATMS provides this capability to this using the ATM VSL module and Event area weather feed
12.56	R	The ATMS must have the ability to process the Weather Feed's atmospheric and pavement condition data to determine the location and limits of a weather event and develop a response plan with location specific messages (i.e. conditions in XX miles or conditions for the next yy miles).	X					iNET ATMS fully meets this requirement.
12.57	R	The ATMS must allow an auto response setup to include a time of day selection. For example, display message X if it is between 7 and 9 AM.	X					iNET ATMS provides this capability using the Travel time modules – alternate TT templates.
12.58	O	Once a sensor is flagged as failed (by ATMS or a TOC Traffic Operations Specialist), ATMS should exclude the	X					iNET ATMS fully meets this requirement.

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		data produced by that sensor from the algorithm. After the sensor has been repaired or re-establishes power/communications, the sensor should be returned to normal operating status (by ATMS or a TOC Traffic Operations Specialist depending on which method the sensor failed) and included in the algorithm.						
12.59	R	When a managed corridor response plan is in operation, the ATMS must display a visual indication on the corridor map/list view. The visual indication (e.g., change color/symbol) must differentiate between the event type (weather or speed).	X					iNET ATMS provides this capability using ATM corridor UI.
12.60	O	The ATMS should provide the ability to initiate a response based on Transportation Performance Measure Reporting and Analysis System (TPMRAS) data.			X			IF this option is selected by MDOT, iNET ATMS will be customized to interface with TPMRAS and create response based on that.
12.61	O	The ATMS should automatically generate an event, generate a response plan, and activate a response plan when a wrong way driving event is detected.		X				iNET ATMS has ability to interface with 3rd party vendor wrong way driver notification systems. This functionality is in place in iNET and would need to be set up and configured in MDOT.
13		Event Management						
13.1	R	The ATMS must provide the ability to create and manage events.	X					iNET ATMS fully meets this requirement. Event Management system allows users to create and manage events through the intuitive and user friendly ATMS GUI.
13.2	N/A	The ATMS must have events that include, but are not limited to the following:						
13.2.1	R	Scheduled (planned), recurring or one-time in nature, such as work zones, special events, etc..	X					iNET ATMS fully meets this requirement. The current iNET system for MDOT are configured to provides all of the required Event types and subtypes.
13.2.2	R	Unscheduled (unplanned), such as something beyond free-flow conditions, impacts to safety or mobility of the transportation system, congestion, crashes, debris on the road, protests, road work, special events, etc.	X					iNET ATMS fully meets this requirement. The current iNET system for MDOT are configured to allow users to create Unscheduled Events.

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13.3	R	The ATMS must provide the ability to initiate an ATMS event from the following methods:	X					
13.3.1	R	ATMS generated events based on internal functionality (e.g., device-based response, system-based response, alert-based response, travel-time-based response).	X					iNET ATMS fully meets this requirement. All the required configuration are in place in MDOT ATMS system to provide all of the ATMS generated events mentioned int his requirement including device based response, system based response, alert based response and TT based response.
13.3.2	R	Third-party system initiated events (i.e., inbound information received via an external integration).	X					iNET ATMS fully meets this requirement.
13.3.3	R	Manually generated event.	X					iNET ATMS fully meets this requirement.
13.4	R	The ATMS must require information about the cause, location, impact and anticipated duration of the event.	X					iNET ATMS fully meets this requirement. All the checks are in place within the system to get information about cause, location etc.
13.5	R	The ATMS must allow scheduled events to be scheduled as recurring events.	X					iNET ATMS fully meets this requirement. Event viewer allows users to create Recurring events.
13.6	R	The ATMS must provide the ability to manage an event from one uniform window regardless of event type.	X					iNET ATMS fully meets this requirement. iNET provides a standard and intuitive Event Viewer window for users to manage any type of Event.
13.7	R	The ATMS must use configurable business rules when creating scheduled and unscheduled events to automatically populate the event location for a user to review, edit, and confirm.	X					iNET ATMS fully meets this requirement.
13.8	R	The ATMS must provide the ability to auto-activate/auto-terminate events.	X					iNET ATMS fully meets this requirement. A checkbox is provided in the Event viewer window – one for autoactivate and the other for auto terminate events. The authorized user can check the corresponding box(es) for auto activation or auto termination.or both.
13.9	R	The ATMS must provide the ability to assign input fields as required that are system configurable.		X				Through system configurations, iNET system will display options within the GUI to the users that will allow them to check input fields as required.
13.10	R	The ATMS must not allow an event to be cleared if there are required fields that are incomplete.			X			Presently iNET does not have any fields for users to fill in before clearing/terminating the events. Contractor will work with the State to understand what the required fields are that must be checked before clearing/terminating the event. iNET software will be customized to incorporate that change.
13.11	R	The ATMS must be capable of automatically populating incident clear time when an event is closed (event closed time equals incident clear time).	X					iNET ATMS fully meets this requirement. The event end time field is automatically populated upon the event close/termination.

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13.12	R	The ATMS must provide a list view of events that can be filtered using available fields within the event and inventory screens.	X					iNET ATMS fully meets this requirement with a full list view that is also filterable by any of the columns.
13.13	R	The ATMS parameters, thresholds, logic, and pre-defined messages must be configurable.	X					iNET ATMS fully meets this requirement. All of the parameters, thresholds, logic, and pre-defined messages are configurable within the system. Most of these are already configured in the current iNET ATMS for MDOT.
13.14	R	The ATMS must provide the capability to configure events which can possess linear, point, and/or polygon attributes.	X					iNET ATMS fully meets this requirement. Any of the event attributes regardless of whether they are point, linear or polygon can be configured within ATMS..
13.15	R	The ATMS must provide the capability to configure an event and continuously update event attributes based on a dynamic polygon identifying weather attributes provided through the State's weather feed.	X					iNET ATMS fully meets this requirement. The required configurations are already in place for updating event attributes based on dynamic area weather polygon data from the State's feed in the current iNET ATMS system for MDOT.
13.16	R	The ATMS must provide user configurable event priorities such as incident severity.	X					iNET ATMS fully meets this requirement.
13.17	R	The ATMS must update the event boundary if the geographic impact of the event changes.	X					iNET ATMS fully meets this requirement.
13.18	O	The ATMS must be capable of monitoring traffic conditions (e.g., volume and speed) within a defined proximity to an existing event and recommend adjustments to response plans associated with the subject event if conditions change. For example, if vehicle speeds are less than XX MPH for a user-defined duration within a special event area post a message to an upstream DMS.			X			iNET ATMS has full capabilities to monitor traffic conditions. Some code enhancements will be required to monitor this with in a defined proximity to an existing event and provide those as inputs for response plans recommendations. Code enhancements will pose no impacted risk to the software system .
13.19	R	The ATMS must provide the ability to split an event into multiple events.	X					iNET ATMS fully meets this requirement. An event can be split into multiple events from within the Event Viewer GUI.
13.20	R	The ATMS must provide the ability to indicate that any event is a secondary event.	X					iNET ATMS fully meets this requirement. An event is secondary event when it has an associated parent event that can be seen in the Event viewer.
13.21	R	The ATMS must provide the ability to link a secondary event to a primary event.	X					iNET ATMS fully meets this requirement.

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13.22	R	The ATMS must provide the ability to associate an event with other attributes, including but not limited to the following:	X					iNET ATMS fully meets this requirement.
13.22.1	R	First responder impacted during course of incident response (e.g., if an emergency response vehicle is struck while assisting an incident).	X					iNET ATMS fully meets this requirement. There is a separate tab within iNET Event viewer where First responder information can be fully entered in detail.
13.22.2	R	Event located within a work zone	X					iNET ATMS fully meets this requirement. User will be able to indicate within Event viewer if the event is located within a work zone.
13.23	R	The ATMS must provide the ability to manually associate an event with a work zone.	X					iNET ATMS fully meets this requirement. This can be done within the Event viewer.
13.24	R	The ATMS must provide the ability to automatically associate an event with a work zone if it occurs within the boundary of an active work zone event.	X					iNET ATMS fully meets this requirement.
13.25	R	The ATMS must provide the ability to add an event directly from the map.	X					iNET ATMS fully meets this requirement. Right clicking on the map at the desired location will allow users to create an event
13.26	R	The ATMS must provide the ability to enter additional information about an event using free-text data entry.	X					iNET ATMS fully meets this requirement.
13.27	N/A	The ATMS must provide the ability to enter, at a minimum, the following types of planned short term and long-term events.						
13.27.1	R	Weather events	X					iNET ATMS fully meets this requirement.
13.27.2	R	Work zones	X					iNET ATMS fully meets this requirement.
13.27.3	R	Amber Alerts	X					iNET ATMS fully meets this requirement.
13.27.4	R	Special events	X					iNET ATMS fully meets this requirement.
13.28	R	The ATMS must provide the ability to categorize work zone events as long term and short term. Events must be able to be reassigned between long- and short-term without recreating the event.		X				There are several ways to meet this requirement. One way is to configure iNET ATMS to include new Event types called Long term and Short term. .Or alternately iNET can provide a checkbox within the Event viewer where the user can indicate whether the event is short term or long term. This will be a quick and easy change.

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13.29	R	The ATMS must provide the ability to setup recurring construction events that allow daily lane closures to be removed from the event without needing to terminate the event.	X					iNET fully meets this requirement. Recurring events can be easily created from within the Event viewer .
13.30	R	The ATMS must provide the ability to modify event information once the event is terminated to ensure data for the event is accurate and all inclusive.	X					iNET fully meets this requirement. Terminated events will appear in the Event list UI for a System configurable time period. Authorized users can edit the event and modify the information and save.
13.31	O	The ATMS should have the ability to automatically generate an event based upon SSP remote-entered data pertaining to vehicle assists, alerts for lane closures and speed-reductions.			X			There is a similar implementation for a diff project but some customizations might be required to meet this requirement in full.
13.32	R	The ATMS must have the ability to automatically generate an event based upon inputs from third-party systems including SSP, Weather Feed, Waze, etc.		X				iNET fully meets this requirement. In the current iNET system for MDOT, most Configurations in place to generate events from various event sources but additional configurations might be required for other sources.
13.33	R	A work zone event must have an identifier which signifies it is a work zone and must store the project contacts within the event. Users must have the ability to update the associated contacts.	X					iNET fully meets this requirement. Event has an identifier for Work zone and contacts can be associated for the event. Contacts can be updated anytime.
13.34	R	The ATMS must be capable of copying the attributes from an existing or terminated event to a new event through a copy/paste or template functionality.	X					iNET fully meets this requirement.
13.35	R	The ATMS must provide the ability to automatically track and report the Traffic Incident Management (TIM) timeline recording when the event was created, responding agencies, arriving unit timelines, when units cleared and when traffic conditions such as queues have cleared.	X					iNET fully meets this requirement. The entire timeline of the Event with all the information mentioned in this requirement is accurately captured and stored in the database for reporting.
13.36	R	If an incident is detected within a work zone, the system must implement a response based upon incident attributes (e.g., severity, location, lanes impacted). The ATMS must continue to manage the DMS messaging based on the queue priority set in the ATMS, and the priority of the messages. The ATMS must provide the	X					iNET ATMS fully meets this requirement. Configurations exist in the current iNET ATMS system for MDOT already providing this functionality. .

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		ability to configure incident attributes and associated response plans.						
13.37	R	The ATMS must provide the ability for the user to use images/schematics to select lanes impacted in lieu of text, drop downs, combo-boxes, etc.	X					iNET ATMS fully meets this requirement.
13.38	O	The ATMS must provide automated/recommended detours based on the event type, roadway type, and severity assigned.	X					iNET ATMS fully meets this requirement. Configurations exist in the current iNET ATMS system for MDOT providing this functionality
13.39	R	When an event includes a full closure of a direction of the freeway, all travel times displayed on DMS signs for the subject routes will be automatically removed from the display.		X				iNET can be configured to fully meet this requirement. Travel times will be automatically removed from display when there is a full closure on a particular direction of the freeway,
13.40	R	The ATMS must automatically generate message syntax based on type of event and the event severity. Syntax templates must provide the ability to be customized per geographical region or TOC.	X					iNET fully meets this requirement. Required Configurations exist in the current iNET ATMS system for MDOT providing this functionality in full.
13.41	R	When a Traffic Operations Specialist updates the lanes impacted by an event the ATMS must provide a view of the proposed message instantly in the same screen.	X					iNET fully meets this requirement. Required Configurations exist in the current iNET ATMS system for MDOT providing this functionality in full.
13.42	R	The ATMS must automatically identify the nearest cross street based on the event location.	X					iNET fully meets this requirement. Required Configurations exist in the current iNET ATMS system for MDOT providing this functionality in full. Location service in the ATMS will automatically pull up the nearest cross street based on the event location.
13.43	R	The ATMS must recognize mile markers as a method for locating events.	X					iNET fully meets this requirement.
13.44	R	The ATMS must recognize roadway sections as a method for locating events.	X					iNET ATMS fully meets this requirement.
13.45	R	The ATMS must recognize roadway interchanges as a method for locating events.	X					iNET ATMS fully meets this requirement.

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13.46	R	The ATMS must automatically populate an event with searchable and filterable information.	X					iNET ATMS fully meets this requirement.
13.47	R	The ATMS user interface must provide the ability to view events in both map and list views.	X					iNET ATMS fully meets this requirement.
13.48	R	The ATMS user interface will provide the ability to view past/expired events in both map and list views. Past/expired event display criteria will be system configurable (i.e., show past/expired events within the previous user-specified date and time range) and color coded (i.e., grayed out) to differentiate with open/active events. The ATMS must be capable of allowing a user to toggle past/expired events from being displayed on the map.			X			iNET ATMS provides the ability to view past/expired events in both maps and list views. The events icons are also color coded differently to be differentiated from Active events. However, customizations will be required to make the display criteria system configurable. Changes will also be made to create a separate layer for expired events on the map allowing users to toggle that layer on and off as needed.
13.49	R	The ATMS must allow expired events to be reactivated.	X					iNET ATMS fully meets this requirement.
13.50	R	The ATMS user interface must provide the ability to select filters that limit the events displayed by each of the event attributes, such as events with lane closures, planned events, and weather events.	X					iNET fully meets this requirement. The list view within iNET allows you to filter and search events by various attributes.
14		Travel Times						
14.1	R	The ATMS must calculate travel times from the State's data sources (e.g., third-party data, vehicle detection), including freeway, ramp, and arterial segments.	X					iNET ATMS fully meets this requirement.
14.2	R	The ATMS must provide the ability to manually select the data source to calculate travel times for a given location (e.g. third-party data, vehicle detection, etc.) available within the ATMS.	X					iNET ATMS fully meets this requirement.
14.3	R	The ATMS must have the ability to configure travel time paths by time of day, day or week, and alternative travel time paths for one sign for different scenarios. For	X					iNET ATMS fully meets this requirement. ATDM module was recently added to meet this requirement.

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		example, travel time paths for peak vs. off-peak periods and normal vs. construction travel.						
14.4	R	The ATMS must provide the capability to calculate travel times based upon user-specified origins and destinations using a map interface.	X					iNET ATMS fully meets this requirement. ATDM iNET allows user to drop a start and end point on the map. The map then pops open the TT set up screen to walk the user through the rest of the path definition. Some configuration is required to enable this feature.
14.5	R	to the ATMS must auto populate and update travel times on DMS and dynamic display panels for routes within the state, at a minimum US, I, and M routes.	X					iNET ATMS fully meets this requirement. Required configurations are already in place in the existing iNET system for MDOT providing this functionality.
14.6	R	The ATMS must allow for Travel Time templates. These templates must be user configurable which allow the Traffic Operations Specialist to set a physical beginning and end point for travel times to be calculated and posted on DMS and digital display panels. The templates must be variable based on Travel Time inputs.	X					iNET ATMS fully meets this requirement. It provides great flexibility to create and configure various Travel Time templates. The current iNET ATMS for MDOT already have the required configurations and various TT templates loaded.
14.7	O	The ATMS should provide a map-based layer with color-coded DMS travel time messages in green, yellow or red based upon a comparison of actual and available historical travel times.			X			Customizations will be made to the software to color code DMS travel time messages suitably based on historical travel times. The software code changes are straight forward and will have no risk impact.
14.8	O	The ATMS should provide the capability to ingest travel times calculated from the State's third-party data provider.	X					iNET ATMS fully meets this requirement.
D		Monitoring						
15		Alerts						
15.1	R	The ATMS must operationally integrate a standard or embedded SNMP trap handler.		X				iNET already has integrated with a few SNMP trap handlers for various use cases. However, Contractor anticipates that there might be additional configurations required depending on the SNMP trap handler that Contractor would need to integrate with.

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15.2	R	The ATMS must provide a handler that receives SNMP traps from all alert-type devices/systems, including but not limited to, the following:		X				iNET will meet these requirements through system configurations. Configurations may include SNMP MIBS that will be broadcast which will be captured by iNET. iNET will then filter on different SNMP traps and generate corresponding alarms.
15.2.1	R	ITS cabinet monitor for door and high temperature alerts.		X				iNET will meet these requirements through system configurations. Configurations may include SNMP MIBS that will be broadcast which will be captured by iNET. iNET will then filter on different SNMP traps and generate corresponding alarms.
15.2.2	R	Over Height Vehicle Detection System (OHVDS).		X				iNET will meet these requirements through system configurations. Configurations may include SNMP MIBS that will be broadcast which will be captured by iNET. iNET will then filter on different SNMP traps and generate corresponding alarms.
15.2.3	R	Bridge Deck Warning System (BDWS).		X				iNETwill meet these requirements through system configurations. Configurations may include SNMP MIBS that will be broadcast which will be captured by iNET. iNET will then filter on different SNMP traps and generate corresponding alarms.
15.2.4	R	Curve Warning System (CWS).		X				iNET will meet these requirements through system configurations. Configurations may include SNMP MIBS that will be broadcast which will be captured by iNET. iNET will then filter on different SNMP traps and generate corresponding alarms.
15.2.5	R	Queue Warning System (QWS).		X				iNET will meet these requirements through system configurations. Configurations may include SNMP MIBS that will be broadcast which will be captured by iNET. iNET will then filter on different SNMP traps and generate corresponding alarms.
15.3	R	The ATMS must generate an event when an alert-type is received from the SNMP trap handler.	X					
15.4	N/A	The ATMS must provide the ability to display alerts and distribute notifications of the alerts via SMS/email to designated users for, at a minimum, the following conditions:						
15.4.1	R	When vehicle travel speed, volume, and occupancy changes exceed user configurable thresholds.	X					iNET ATMS fully meets this requirement.

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15.4.2	R	When an incident is initially populated from a third-party system.	X					iNET ATMS fully meets this requirement.
15.4.3	R	When weather conditions obtained from the Weather Feed exceed user configurable thresholds.	X					iNET ATMS fully meets this requirement.
15.4.4	R	When an oversized vehicle is detected from an OHVDS alert.		X				iNET will meet this requirement through system configurations. Different kinds of alerts can be configured with in the ATMS for sending out notifications to various designated user groups.
15.4.5	R	When ITS field device status changes (offline, online).	X					iNET ATMS fully meets this requirement.
15.4.6	R	When ITS field device data is out of normal range.		X				The range of values for ITS field devices will be specified as part of the system configurations. Through configurations, this requirement will be met.
15.4.7	R	When ITS field device data is not reporting.		X				Alert will be produced within the system but some system configuration will be required for sending out notifications to designated users.
15.4.8	R	When ITS field device and subsystem errors are received. The error messages must provide sufficient details to support troubleshooting the root cause of the error.			X			iNET system logs the errors in detail received from the field devices. However, Contractor is working on collecting more in-depth details from devices and propagating that to the GUI to support faster and more efficient troubleshooting. This is a work in progress targeted to be completed later this year.
15.4.9	R	When a cabinet door is open for more than a user configurable threshold through integration with the ATMS SNMP trap handler.	X					iNET ATMS fully meets this requirement.
15.4.10	R	When an incident is detected/manually entered within a work zone.	X					iNET ATMS fully meets this requirement.
15.4.11	R	When an adverse weather event is received from the Weather Feed.	X					iNET ATMS fully meets this requirement.
15.5	R	The ATMS must provide the ability to enable/disable the alert generation from specific data feeds.	X					iNET ATMS fully meets this requirement.
15.5.1	O	The ATMS should provide the ability to turn off alerts for disabled devices.	X					iNET ATMS fully meets this requirement.
15.6	N/A	The ATMS must provide the ability to configure alert notifications, including the following:						

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15.6.1	R	Enable/disable specific alerts by user, geographic coverage area, or system wide		X				Alert can be enabled/disabled by users and district. This is a configuration item..
15.6.2	O	Configure count and persistence thresholds, such as “alert after condition true for 5 minutes” or “alert after condition occurs 5 times in 10 minutes”		X				System can be configured to fully meet this requirement.
15.7	R	The ATMS must provide the ability to save alert preferences by user, user role profile, and geographical coverage area.		X				GUI can filter alert visibility and save those filters. System alerts are configured by districts. Email/SMS notifications are configured by contact.
15.8	R	The ATMS must provide the ability to dismiss, acknowledge, and/or combine alerts associated with an event via the GUI and SMS/email.		X				iNET ATMS fully meets this requirement. GUI can split and merge traffic events. GUI can acknowledge and hide alerts. Acknowledgement and escalation of alerts by email and SMS contacts is a new feature releasing in 2022.
15.8.1	R	The ATMS must provide the ability to populate an event creation window with relevant and available information, including event location once an alert is acknowledged.		X				The ATMS system can be configured to give user the option to create an event from the Alerts screen and the event location will get populated automatically.
15.9	R	The ATMS must provide alerts to additional users if the user-specified alert is not acknowledged within a user-defined amount of time.		X				Acknowledgement and escalation of alerts by email and SMS contacts is a new feature releasing in 2022.
15.10	R	The ATMS must provide the ability to configure alert types (pop-up, toast, notification bar, etc.).			X			Customizations will be required to allow privileged users to configure alert types within the ATMS GUI. ATMS will provide a drop down of different alert type selections such as Pop up, notification bar etc, on the Configuration window. Depending on the selection, the ATMS will provide the alerts through those means. The code enhancements to meet this requirement will not pose any risk to the system functionality.
15.11	R	The ATMS must distinguish between roadway, system, communications network, and field device alerts.	X					iNET ATMS will fully meet this requirement.
15.12	R	The ATMS must provide a clear indication of the presence of a new alert.	X					iNET ATMS will fully meet this requirement. There is a clear visual indication within ATMS GUI when there is a new alert.
15.13	R	The ATMS must provide all active alerts in a list view that is searchable and filterable by type, priority, device ID, location, frequency, etc.	X					iNET ATMS will fully meet this requirement. ATMS provides a list of Alerts that are searchable, sortable and filterable.

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15.14	R	The ATMS must provide the ability to designate alerts as hard or soft prompts. Soft prompts must allow users to verify alerts before addressing the alert pop-up.	X					iNET ATMS will fully meet this requirement.
15.15	O	The ATMS should provide an alert if an event has been open for a user configurable time threshold without any activity (stale). The alert should be provided to all users and not limited to the user who initiated the event.		X				iNET ATMS can be configured to indicate time threshold without activity.
15.16	O	The ATMS should remove an alert pop-up that requires action from all other user accounts and workstations once a Traffic Operations Specialist acknowledges.			X			Customizations will be made for this so that the system can disable pop up alerts when the first acknowledgement is made by the Operation specialist.
15.17	R	The ATMS must provide business rules that alert designated users when the geographic range of impact of a verified incident changes (impact extent defined by incident duration and traffic congestion).			X			Customizations will be made to create a backend process within Event subsystem that monitors the geographic impact of a confirmed incident. If impact exceeds the threshold conditions defined by incident duration and congestion, an alert will be created for designated users.
15.18	R	The ATMS must provide the ability to configure alerts based on real-time probe data.	X					iNET ATMS will fully meet this requirement.
15.19	R	The ATMS must alert users and/or administrators when speed, pavement, or weather data exceed pre-defined thresholds. Once activated, the ATMS must continue to monitor speed, pavement, and weather data against pre-defined thresholds and automatically adjust messages based on real-time changing conditions.	X					iNET ATMS will fully meet this requirement.
15.20	O	The ATMS should alert users when current traffic conditions (e.g., speed, volume) exceed historical values by a user-defined threshold. For example, if a subject segment typically averages 35 MPH between 4-5pm, provide an alert when average speeds drop below 25 MPH for more than five minutes between 4-5pm.			X			Contractor has implemented a similar requirement for a different client. This will be ported over and some customizations would be made to fully meet this requirement.
15.21	R	If the number of device failures within the VSA system exceeds the threshold and does not allow the system to process data and develop recommended response	X					iNET ATMS fully meets this requirement.

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		plans, an alert must be provided to the TOC Traffic Operations Specialist.						
15.22	R	The ATMS must provide an alert when the user defined minimum or maximum parking count value is reached and/or exceeded on a per site basis as provided by the Parking Information Management System (PIMS).	X					iNET ATMS fully meets this requirement.
16		Notifications						
16.1	R	The ATMS must provide the ability to automatically notify stakeholders or groups of stakeholders of issues in ITS field devices with configurable parameters for count and persistence, separate from count/persistence thresholds for alerts.	X					iNET ATMS fully meets this requirement.
16.2	R	The ATMS must provide the ability to automatically notify stakeholders or groups of stakeholders of failures in communications network links and devices.	X					iNET ATMS fully meets this requirement.
16.3	R	The ATMS must provide the ability to configure alerts as notifications.		X				Alerts can be configured as notifications
16.4	R	The ATMS must provide the ability to configure notifications and events as emails/SMS, and the delivery method should be configurable per user including syntax modifications.	X					iNET ATMS fully meets this requirement.
16.5	N/A	The ATMS must provide the ability to automatically populate notification correspondence, with the ability to manually edit, for stakeholders or groups of stakeholders based on major changes in traffic operations due to an incident, following the TIM timeline, or event including:						
16.5.1	R	Complete roadway closures	X					iNET ATMS fully meets this requirement.
16.5.2	R	Closed roadway is reopened to travel	X					iNET ATMS fully meets this requirement.

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16.5.3	R	One or more travel lanes are closed at specified time of day	X					iNET ATMS fully meets this requirement.
16.5.4	R	Closed travel lanes are reopened to travel	X					iNET ATMS fully meets this requirement.
16.5.5	R	Major incident in a work zone	X					iNET ATMS fully meets this requirement.
16.5.6	R	Major incident in a work zone is cleared	X					iNET ATMS fully meets this requirement.
16.5.7	R	Major incident for a significant pre-defined planned event		X				Configuration will be required for predefined planned event
16.5.8	R	Major incident for a significant pre-defined planned event is cleared		X				Configuration will be required for predefined planned event
16.6	R	The ATMS must provide system configurable stakeholder classification types (e.g., internal, external, public, etc.).		X				Configurations to add stakeholder classification types to drop down in the agency field.
16.7	R	The ATMS must adjust the content of pre-populated notifications based on the stakeholder classification.			X			Customization will be made to meet this requirement. The content will be automatically picked depending on the classifications.
16.8	R	The ATMS must provide the ability to manage and define notification priorities, and to determine the distribution of notifications based on event condition criteria.			X			Customization will be made to meet this requirement.
16.9	R	The ATMS must provide the ability to manage and define specific time and/or which stakeholders or group of stakeholders receive specific notifications.			X			iNET has time based notifications but customization will be required for notifying stakeholders depending on their groups.
16.10	R	The ATMS must provide a notification when a new event generated in proximity or in conflict with a current active event.			X			Customization will be made to meet this requirement. When a new event is created, system will look for other events within a defined proximity (configurable) or conflicting events. If detected, the designated users will be notified.
16.11	R	The ATMS must be configurable so that notification recipients can receive notifications based on their permissions, area of responsibility, and event priority.	X					iNET fully meets this requirement. The user will be notified based on their role. region and the event priority.
17		Dashboards						

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17.1	R	The ATMS must provide the ability to configure dashboard performance metrics to adjust which indicators are displayed and the geographical area included in the dashboard.	X					iNET ATMS fully meets this requirement.
17.2	R	The ATMS must provide the ability to have multiple dashboards.	X					iNET ATMS fully meets this requirement.
17.3	R	The ATMS must provide the ability to configure dashboard performance metrics to display based on current system data, such as number of active incidents, system health, and device status.	X					iNET ATMS fully meets this requirement.
17.4	N/A	The ATMS must provide the ability to view dashboard indicators of current traffic operations within the following areas:						
17.4.1	R	Traffic conditions by corridor, area, and work zone (e.g., vehicle speeds)		X				
17.4.2	R	ITS field device function and availability by corridor, area, and work zone		X				
17.4.3	R	System operations (e.g., ATM, ATDM, VSA)		X				
17.4.4	R	Live event statistics such as number of events, events by severity, and event duration totals.		X				
17.5	O	The ATMS should have the ability to provide access to the dashboards while on the internal network without being logged into the ATMS.		X				
18		Reports						
18.1	R	The ATMS must provide the ability to prepare templated reports using data collected by the ATMS.		X				iNET currently provides ATM reports using Jasper. The other reports such as for DMS, VDS, Events etc. are currently being maintained in Business objects by MDOT/DTMB staff. Contractor will assist MDOT/DTMB with related queries on needed basis. If the client requires, those reports can be converted to Jasper reports.
18.2	R	The ATMS must provide the ability to use data collected by the ATMS to be calculated in support of performance monitoring.		X				iNET saves all of the data related to activation response, Incident start time, Incident clearance times etc. that are required for calculating system performances. Parson can create these reports in Jasper or provide queries to be run in Business objects.

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18.3	R	The ATMS must provide the ability to create and save ad-hoc reports using data collected by the ATMS.	X					iNET ATMS fully meets this requirement.
18.4	R	The ATMS must provide the ability to query the database for traffic operation and event management data for the use of developing reports.	X					The user will be able to query data in the ATMS database.
18.5	O	The ATMS should provide the ability to generate reports which compares current vs. historical travel conditions. Historical travel condition data should be available as defined in the MDOT ITS/TOC Retention Schedule.			X			Custom reports will be created to fully meet this requirement.
18.6	R	The ATMS must have the ability to run reports of data that has been archived without Contractor support.	X					This requirement is fully met.
18.7	R	The ATMS must provide a traffic incident management timeline report that provides each action/response taken during an event, including recording when the event was created, responding agency/agencies, arriving unit timelines, when units cleared and when traffic conditions such as queues have cleared.	X					This requirement is fully met. All of this information is recorded and be retrieved within ATMS.
18.8	R	The ATMS must have the capability of providing summary reports for hardware, software, and communication errors.	X					This requirement is fully met.
18.9	R	The ATMS must have the ability to provide an ITS device report based on any alerts or faults received from the device.		X				These reports exist in business objects but if required, these can be quickly created in Jasper reports.
18.10	R	The ATMS must provide a report of library response plan messages, detailing the DMS involved, the messages in the plan, and the priority level of the messages.		X				This requirement will be met using Jasper reports. Data already available in archive database.
18.11	R	The ATMS must record a history of messages displayed on all DMS signs beginning at system activation,		X				This requirement will be met using Jasper reports. Data already available in archive database.

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		including location, date, time, and duration of the message being displayed.						
18.12	O	The ATMS should provide the ability to provide call-tracking reports.			X			If this option is selected, custom reports will be created for call tracking.
18.13	R	The ATMS must include reporting templates for systems deployed along managed corridors.	X					This requirement is already met and configured for in the current iNET system for MDOT.
18.14	R	The ATMS must be able to provide a historical record of an event that indicates the progression of actions taken through the ATMS, response plan used, and changes in traffic conditions from the start of an event until its conclusion.		X				This requirement will be met using Jasper reports. Data already available in archive database.
18.15	R	The ATMS must be able to calculate, aggregate, store and report on traffic statistics (e.g., travel times, speed, volume, capacity, vehicle classification, etc.) for a given time period and location queried by a user.			X			iNET allow the state to set up sections in which travel times are calculated for DMS and stored for reporting. However, Contractor is not aware of any current reports that use this data. New reports can readily be created for them.
18.16	R	The ATMS must record ramp meter on/off times, response plan, and metering algorithm for both automatic and manual activation.		X				Ramp meter module will be configured within iNET to fully meet this requirement.
18.17	R	The ATMS must report a cumulative queue length over a given period based on detector location.		X				Contractor is currently working on this requirement and it will be ready in time for this project. This feature can be ported over to MDOT implementation upon completion.
18.18	R	The ATMS must record all raw vehicle detector data.	X					This requirement is fully met.
18.19	R	The ATMS must provide the ability to aggregate raw vehicle detector data at user defined intervals.	X					This requirement is fully met.
18.20	O	The ATMS should be capable of assigning a customizable report footer that specifies data			X			Customization will be made to provide the capability of specifying data classification in the customizable report folder..

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		classification (e.g., Public, Internal, Confidential, Restricted).						
18.21	R	The ATMS must allow users to export all reports in CSV, Excel, and PDF format.	X					This requirement is fully met.
18.22	R	The ATMS must provide the ability to pull reports of events located within work zones and associate the work zone project job number (JN), route, and mile marker extents with each entry.			X			All the event and work zone information is available in the system. Custom reports will be created to meet this requirement.
18.23	R	The ATMS must have the capability of providing reports for hardware information by region, TOC coverage area, device type, managed corridor, and/or system.		X				Contractor will create these reports in Jasper.
18.24	R	The ATMS must provide the ability to schedule and/or automate reports using data collected by the ATMS and distribute via email.			X			Customizations will be required to meet this requirement to create report schedulers and automation of reports for email notifications.
18.25	R	The ATMS must have the ability to run reports in any of the ATMS environments (i.e., Testing Environment, Production Environment, etc.) using data collected by the ATMS.	X					This requirement is fully met.
18.26	R	The ATMS must provide the ability to modify reporting limits (e.g., number of rows/columns, query processing time, count size) for the efficient retrieval of reports.	X					This requirement is fully met.
18.27	O	The ATMS should provide the ability to compress and download a report.	X					This requirement is fully met.
19		Call Tracking						
19.1	O	The ATMS should provide call-tracking capable of storing contact name, organization, and phone which can be referenced separately of an event.			X			If this option is selected, call tracking system will be created through custom development. All of these specified information will be stored and can be referred to an event.

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19.2	O	Call-tracking should be capable of recording call types (in-bound and out-bound), with the ability to populate free-text notes and link calls to Events. Call types should be editable by an authorized user.			X			If this option is selected, this requirement will be fully met through custom development.
19.3	O	The Traffic Operations Specialist should be able to select the action they or others have taken with-in the call-tracking functionality, such as initiate an event, dispatch SSP. Action types should be editable by an authorized user.			X			If this option is selected, this requirement will be fully met through custom development.
19.4	O	The ATMS should provide call-tracking capable of interfacing with Voice over Internet Protocol (VOIP) phone systems with the ability to populate incoming and outgoing call information into the call log without action by the Traffic Operations Specialist, such as the phone number and time the call was made or received. The State of Michigan currently utilizes the Cisco Unified Communications Manager version 12.5 for its VOIP phone systems.			X			If this option is selected, interfaces will be developed with VoIP systems to ingest information related to incoming and outgoing calls and populate the call log without manual intervention.
19.5	O	The call-tracking functionality should store external contact information within the event for incoming and outgoing calls.			X			If this option is selected, this requirement will be fully met through custom development.
19.6	O	The call-tracking functionality should be search-able/have the ability to filter the logged information from the production environment, as well as in the archived environment. All fields entered should be search/filterable.			X			If this option is selected, this requirement will be fully met through custom development.
E		Interfaces						
20		Email, Text, and Social Media Interfaces						

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20.1	N/A	The ATMS must be able to automatically populate and send an email and Short Message Service (SMS), based on event details to specified personnel and groups identifying the condition, time, event, and location of the following:						
20.1.1	R	Incidents		X				System can be configured to send emails and SMSes for info related to Incidents.
20.1.2	R	Device Maintenance		X				System can be configured to send emails and SMSes for info related to Device maintenance.
20.2	R	The ATMS must have the ability to integrate with the State of Michigan GovDelivery Email Subscription Service for the purpose of notifying stakeholders with relevant information that have subscribed for applicable notifications.	X					The current iNET system is already to configured to meet this requirement.
20.3	R	The ATMS must integrate with social media, at a minimum Twitter, to communicate planned event, incident, and traveler information with the traveling public. The ATMS must prepopulate a social media message based on event details for a user to review, edit, and confirm prior to posting to social media.			X			Twitter has been integrated in some other ATMS implementations. This will be ported over and customized as appropriate to fully meet this requirement. .
21		Lane Closure and Restrictions (LCR)						Currently provided by TerraForm Manager (Mixon Hill)
21.1	R	The ATMS must interface (e.g., pull, ingest, and display data) with the State's Lane Closure and Restriction (LCR) system.			X			Custom development required to develop interface with LCR and ingest data to meet this requirement.
21.2	R	The ATMS must ingest lane closure and construction events provided through the Work Zone Data Exchange (WZDx) specification format version 4.0.			X			Custom development required to develop interface through WZDx using spec 4.0
21.3	R	The ATMS must be backward and forward compatible interfacing with WZDx versions (e.g., compatible with version 3.1 through current).			X			Custom development required to meet this requirement.

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21.4	R	The ATMS must have the ability to auto-populate an event based on lane closure and construction information received from the external LCR interface.		X				System can be configured to auto populate event based on LCR data once the interface with LCR is complete.
21.5	R	The ATMS must provide the ability for construction events to auto-activate and auto-terminate, based on information received from the external LCR interface.	X					Once interface with LCR s complete and data is being ingested, ATMS will automatically meet this requirement. It already has the ability to auto activate and auto terminate.
22		Mi Drive						
22.1	R	The ATMS must interface with Mi Drive, MDOT's public dissemination website, through the ATMS API, to avoid dual entry. At a minimum, information shared with MiDrive must include traffic operations data (incidents, debris, and disabled vehicles), active DMS messages, and parking lot availability.	X					The current iNET system for MDOT already meets this requirement.
22.2	R	The ATMS must provide the ability to select which event types are shared with Mi-Drive by default.	X					The current iNET system for MDOT already meets this requirement.
22.3	R	The ATMS must provide the capability to manually override an individual event to be or not to be shared with Mi-Drive.	X					The current iNET system for MDOT already meets this requirement.
23		Weather Feed						Currently provided by TerraForm Manager (Mixon Hill)
23.1	R	The ATMS must interface with the State's current and future third-party hosted Weather Feed.	X					The current iNET system for MDOT already meets this requirement.
23.2	N/A	The Weather Feed must include the following interfaces:						
23.2.1	R	The State's environmental sensor stations (ESS) speeds)			X			iNET already interfaces with the State's current feed, however if that changes it is possible that minimal customizations would need to be made to iNET software to meet this requirement.

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23.2.2	R	The State's weather polygon feed, which is made up of data from the National Weather Service (NWS), automated service observing system (ASOS)/automated weather observing system (AWOS) (airport) weather data, AVL mobile weather data, State ESS, and other sources to provide a dynamic polygon with associated weather conditions attributes			X			iNET Currently interfaces with Mixon Hill for ESS data, additional vendors could require some customization to interface with. Although, Contractor has already interfaced with several weather providers. See the ATMS Interface document attached to proposal
23.3	R	The ATMS must ingest ESS data provided through an API which includes NTCIP 1204 sensor and observation values in JSON or XML format.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
23.4	R	At a minimum, the ATMS must obtain, store, and simultaneously display the following ESS statuses: air temperature, barometric pressure, relative humidity, dewpoint, wind direction/speed, visibility, and precipitation.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
23.5	R	At a minimum, the ATMS must obtain, store, and simultaneously display inputs from sensors providing surface temperature, sub-surface temperature and pavement surface state condition.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
23.6	R	The ATMS must list and display data for sensors present at a given ESS.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
23.7	R	The ATMS must provide the capability to automatically and manually create weather events based off Weather Feed data.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
23.8	R	The ATMS must support the use of atmospheric sensor data in algorithms used to automate system actions.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
23.9	R	The ATMS must provide the ability to simultaneously compare real-time sensor readings from a list of selectable ESS sites in a single view.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.

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23.10	R	The ATMS must ingest weather radar layers and weather alerts from the National Weather Service (NWS) through the Weather Feed provider.		X				Requires configuration and customization to meet this requirement.
23.11	R	The ATMS must poll the Weather Feed (for ESS and pavement condition data) at a configurable frequency of at least once per minute.	X					iNET ATMS fully meets this requirement.
23.12	R	The ATMS must provide storage of the data received from the ESS and pavement condition sensor interfaces for evaluation, per MDOT's ITS/TOC Retention Schedule per data type.	X					iNET ATMS fully meets this requirement.
24		Probe Data						
24.1	R	The ATMS must have the ability to ingest third-party probe data which the State may provide through a separate contract.	X					Interfaces with HERE and INRIX were developed for iNET for MDOT.
24.2	R	The ATMS must provide the capability to use ingested probe data in its algorithms used to automate system actions.	X					iNET provides this capability to use ingested data in its algorithm
25		Automated Vehicle Location (AVL)						
25.1	R	The ATMS must interface with vehicles outfitted with AVL technology in real time.			X			ATMS has interfaced with AVL vendor ITRACK in the past. Additional vendor implementations can be added, but could require some customization.
25.2	R	The ATMS must be able to ingest vehicle location data from the outfitted AVL vehicles.	X					iNET fully meets this requirement.
25.3	R	The ATMS must be able to display the outfitted AVL vehicle location data ingested on the ATMS map.	X					iNET fully meets this requirement.
25.4	R	The ATMS must be able to display data attributes provided from the outfitted AVL vehicles.	X					iNET fully meets this requirement.
25.5	O	The ATMS should provide the ability to view dashcam footage or snapshots in real-time as provided by AVL vehicles integrated into the ATMS.		X				This is being implemented for a different project currently. This feature will be ready in time for this project. It will be ported over to MDOT upon completion.

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F		Managed Corridors						
26		Strategy: Dynamic Lane Control and Dynamic Shoulder Use						
26.1	R	The ATMS must provide the ability to generate, selected, and post lane control indications in the form of a color graphic/image on the full size of the LCS display matrix (approximately 64 pixels tall x 80 pixels wide).	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
26.2	N/A	The ATMS must provide the ability for Traffic Operations Specialists to generate, select, and post the following lane indications:						
26.2.1	R	Open: static green "↓" on a black background.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
26.2.2	R	Closed: static red "X" with the word "CLOSED" below on a black background.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
26.2.3	R	Merge (right and left): dynamic 3-phase message with yellow chevrons and the word "MERGE" below on a black background. The messages must consist of one, two, and three chevrons (">" followed by ">>" followed by ">>>", followed by ">", etc.).	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
26.2.4	R	Merge (right and left): static message with three yellow chevrons and the word "MERGE" below on black background or a MUTCD-compliant merge sign image.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
26.2.5	R	Variable speed advisory: dynamic amber speed message using two numeric digits with the word "MPH" on a black background.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.
26.3	R	The ATMS must require confirmation by a Traffic Operations Specialist through a designated prompt prior	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT.

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		to modifying, overwriting, and deactivating the response plan or any lane control indication on any LCS.						
26.4	R	The ATMS must include a conflict monitoring mechanism to ensure LCS's do not display conflicting messages on a single gantry or adjacent gantries (e.g., a left merge ">>>" adjacent to a right merge "<<<" on the same gantry that indicates two lanes merging into one another).	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT
26.5	R	The ATMS must have the ability to control LCS's individually and by user-selected groups.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT
26.6	R	The ATMS must recommend opening and closing travel on the shoulder lane, via a response plan using lane control indication, DMS, and BOS, based on defined thresholds of condition, time, and event.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT
26.7	R	The ATMS must require a Traffic Operations Specialist to confirm the opening and closing of the shoulder prior to changing messages on any LCS, DMS, BOS, or digital display panel.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT
26.8	R	The ATMS must use predefined templates with DMS messages that indicate when the dynamic shoulder lane is active, for both Large and Small DMS.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT
26.9	R	The ATMS must log data to assess schedule reliability (opening on time), frequency and reason for unscheduled shoulder opening and closing, device up-time, frequency of issues and work orders issued, Traffic Operations Specialist prompts (e.g., off-peak shoulder openings) accepted and rejected, and time between shoulder open recommendation and actual opening.	X					iNET ATMS fully meets this requirement. This system is fully configured and functional in the current iNET ATMS for MDOT
27		Strategy: Variable Speed Advisory (VSA)						
27.1	N/A	The ATMS must utilize user defined thresholds to determine advisory speeds based on the following near real-time data:						

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27.1.1	R	Vehicle speeds (probe data, vehicle detector)	X					iNET ATMS fully meets this requirement.
27.1.2	R	Lane occupancy (vehicle detector)	X					iNET ATMS fully meets this requirement.
27.1.3	R	Pavement conditions (icy, wet, etc.)	X					iNET ATMS fully meets this requirement.
27.1.4	R	Weather conditions (atmospheric, visibility, weather polygons, etc.)	X					iNET ATMS fully meets this requirement.
27.1.5	O	The ATMS should provide hysteresis for input data.	X					iNET ATMS fully meets this requirement.
27.2	R	The ATMS advisory speed calculation must include both “and” and “or” logic when evaluating near real-time data.	X					iNET ATMS fully meets this requirement.
27.3	R	The ATMS must allow a user-configurable minimum and maximum VSA advisory speed.	X					iNET ATMS fully meets this requirement.
27.4	R	The ATMS must be capable of adjusting advisory speed messages between a user defined minimum and maximum speed.	X					iNET ATMS fully meets this requirement.
27.5	R	The ATMS must be capable of posting a text-based message (e.g., SLOW) if the conditions warrant speeds below the minimum defined VSA advisory speed.	X					iNET ATMS fully meets this requirement.
27.6	R	The maximum VSA must never exceed the roadway's posted maximum speed limit.	X					iNET ATMS fully meets this requirement.
27.7	R	The ATMS must provide a user-configurable parameter (e.g., 1 minute) representing the minimum amount of time a VSA must persist before changing.	X					iNET ATMS fully meets this requirement.
27.8	R	The ATMS must allow the Traffic Operations Specialist to specify a maximum VSA speed that is lower than the posted speed based upon adverse weather conditions, or for signs within Work Zones. Manual override should have the ability to exceed this.	X					iNET ATMS fully meets this requirement.
27.9	R	The ATMS must allow the Traffic Operations Specialist to select and post the reduced speeds on all signs in the affected zone(s).	X					iNET ATMS fully meets this requirement.
27.10	R	The ATMS must be capable of determining recommended step-down speeds in advance of an	X					iNET ATMS fully meets this requirement.

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		advisory speed based on the number of advanced signs and speed differential. For example, a speed reduction from 60 MPH to 40 MPH would require a minimum of two signs if the maximum speed difference between two signs is defined as 10 MPH.						
27.11	R	The ATMS must continuously evaluate near real-time data and recommend activation and de-activation of VSA messages based on user-defined thresholds.	X					iNET ATMS fully meets this requirement.
27.12	R	The ATMS must be capable of turning VSA on and off by corridor and by direction.	X					iNET ATMS fully meets this requirement.
27.13	N/A	The ATMS must provide the ability to set the VSA to the following operational modes:						
27.13.1	R	Auto - for the system to determine when to automatically turn on/off the VSA prompt, by corridor and direction	X					iNET ATMS fully meets this requirement.
27.13.2	R	Manual – for the system to have the ability to manually turn on/off the VSA prompt, by corridor and direction.	X					iNET ATMS fully meets this requirement.
27.14	R	The ATMS must provide the ability to enable/disable the auto/manual VSA prompt feature by corridor and direction.	X					iNET ATMS fully meets this requirement.
27.15	R	If one or more DMS and/or LCS are failed within the proposed response plan, the VSA must revert from automatic implementation to requiring TOC Traffic Operations Specialist verification.	X					iNET ATMS fully meets this requirement.
27.16	R	Once activated, the ATMS must be capable of automatically adjusting VSA messages (speeds) without Traffic Operations Specialist input.	X					iNET ATMS fully meets this requirement.
27.17	R	The ATMS must allow VSA speeds to be overridden by a Traffic Operations Specialist. Once overridden the speed must remain and not be automatically adjusted until the manual override is removed or the VSA is turned off.	X					iNET ATMS fully meets this requirement.

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27.18	R	Slowed traffic must automatically trigger a messaging plan with wording (e.g., Reduced Speed) and a distance (e.g., XX Miles Ahead).	X					iNET ATMS fully meets this requirement.
27.19	R	The maximum speed recommended by the ATMS must be configurable based on the weather conditions provided by the Weather Feed polygon.	X					iNET ATMS fully meets this requirement.
27.20	R	Upon deactivation of VSA, all active VSA response plans must be removed from each DMS and/or LCS.	X					iNET ATMS fully meets this requirement.
27.21	R	The ATMS must include a “corridor schematic view” displaying all devices within the VSA limits in a logical layout based on field placement (e.g., north to south). The map must be designed such that overlapping icons can be individually selected at any zoom level. The icons must display each device’s operational status and individual LCS messages. The corridor schematic view does not need to be geographically correct.	X					iNET ATMS fully meets this requirement.
27.22	R	The ATMS must allow a Traffic Operations Specialist to change the parameters associated with an individual sign, or a group of signs from the VSA corridor schematic view.	X					iNET ATMS fully meets this requirement.
27.23	R	The ATMS must log all changes in displayed speeds to the database. The log records must include the following data: reason for speed limit change, speed limit change, segment to which the advisory speed applies, the timestamp showing when the data was calculated, sensor data used to calculate speed, duration of speed limit change, DMS location(s) displaying speed change, and number of prompts requiring TOC Traffic Operations Specialist verification.		X				iNET ATMS meets almost all of the specified requirements here except the number of prompts requiring operation specialists’ verification. System will need to be configured to capture this information in the logs as well.
28		Strategy: Queue Warning						
28.1	R	The ATMS must activate queue warning notifications (e.g., flashing beacons, LED border signs, DMS, BOS,		X				iNET ATMS configurations will be made to control the beacons. The ATMS is already configured to meets other requirements specified here such as LED border signs, DMS, etc.

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		and MDOT- and contractor-owned PCMS) when traffic queues are detected via vehicle detection inputs (e.g., probe data, MVDS). Traffic queues must be detected based on vehicle speeds remaining below a user defined threshold for a user defined timeframe.						
28.2	R	The ATMS must record queue warning system activations including location, roadway direction, date, time, and cumulative time the activation remains in effect.	X					iNET ATMS fully meets this requirement.
28.3	R	The ATMS must process and include vehicle probe and vehicle detector data in the algorithm(s), to be used in developing queue warning response plans (e.g., stopped traffic, slowed traffic).	X					iNET ATMS fully meets this requirement.
28.4	R	The ATMS must process and include individual lane data, not the average across all lanes, in the algorithm(s), to be used in developing queue warning response plans (if provided by the vehicle detector).	X					iNET ATMS fully meets this requirement.
28.5	R	Slowed traffic must automatically trigger a messaging plan with wording (e.g., Reduced Speed) and a distance (e.g., XX Miles Ahead).	X					iNET ATMS fully meets this requirement.
28.6	R	While in the slowed zones, the system must support automatic messaging (e.g., Reduced Speed) with a distance (e.g., Next YY Miles).	X					iNET ATMS fully meets this requirement.
28.7	R	The speed threshold of slowed or stopped traffic must be configurable.	X					iNET ATMS fully meets this requirement.
28.8	R	The ATMS must allow a Traffic Operations Specialist to activate or deactivate the system's automatic posting of queue warning messages.	X					iNET ATMS fully meets this requirement.
28.9	R	The ATMS must include a “corridor schematic view” displaying all devices within the queue warning limits in a logical layout based on field placement (e.g., north to south). The map must be designed such that overlapping icons can be individually selected at any	X					iNET ATMS fully meets this requirement.

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Business Specification Number	**Business Specification Type**	**Business Specification Description**	**Current Capability**	**Requires Configuration**	**Requires Customization**	**Future Enhancement**	**Not Available**	**Contractor to explain how they will deliver the business Specification. Explain the details of any configuration/customization and the impacted risk that may be caused if configured or customized to meet the business specification.**
		zoom level. The icons must display each device's operational status. The corridor schematic view does not need to be geographically correct.						
29		Strategy: Ramp Metering						
29.1	N/A	The ATMS must ingest and monitor vehicle detection data with the ability to denote the following locations.						
29.1.1	R	Immediately downstream of the entrance to the ramp (advance detection).	X					iNET ATMS fully meets this requirement. Downstream detection can be a part of traffic responsive detection configuration within the controller at the location, or adaptive ramp metering within central.
29.1.2	R	Mid-point on the ramp (intermediate detection).	X					iNET ATMS fully meets this requirement. It reports as a detector within a ramp entity, with vehicle count and occupancy.
29.1.3	R	Immediately upstream of the ramp meter stop bar (demand detection).	X					iNET ATMS fully meets this requirement.
29.1.4	R	Immediately downstream of the ramp meter stop bar (passage detection).	X					iNET ATMS fully meets this requirement. It reports as a detector within a ramp entity, with vehicle count and occupancy. In addition, violations are reported.
29.2	R	The ATMS must provide the ability to manually activate and deactivate ramp meters, by sending commands to the ramp meter field controller.	X					iNET ATMS fully meets this requirement.
29.3	R	The ATMS must provide the ability to manually modify metering rates, by sending commands to the ramp meter field controller. Manual rate settings must take priority over dynamic rates. The metering rate must reset to the algorithm's default rate once the ramp meter is deactivated.	X					iNET ATMS fully meets this requirement. Manual Rates by definition always take Priority based on the settings of NTCIP 1207.
29.4	N/A	The ATMS must be capable of recommending ramp meter activation and deactivation based on the following conditions:						
29.4.1	R	Time of day	X					iNET ATMS fully meets this requirement.
29.4.2	R	Traffic conditions (vehicle speeds, lane occupancy) collected by vehicle detectors	X					iNET ATMS fully meets this requirement.

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29.5	R	The ATMS must be configurable to require confirmation from a Traffic Operations Specialist prior to activation or to automatically activate.	X					iNET ATMS fully meets this requirement.
29.6	R	The ATMS must be capable of activating, deactivating, and adjusting parameters for the following ramp metering operational approaches. The ATMS must be capable of recommending which operational approach should be used based on time of day and current traffic conditions.	X					iNET ATMS fully meets this requirement. Downstream detection can be a part of traffic responsive detection configuration within the controller at the location, or adaptive ramp metering within central.
29.6.1	R	Fixed Rate Ramp Metering: Operates each ramp individually at a fixed rate specified for a designated time period. Fixed rate ramp metering should not require any data input from detectors.	X					Fixed rate ramp metering can be run based on demand loop or constant call. Functionality will be based on NTCIP 1207 mib rmcDemandMode shown below recalled - indicates that the demand detector will constantly place a call even without a vehicle being present in its detection zone. enabledCall - indicates that the demand detector is ready to detect, and shall constantly place a call when it has failed. enabledStop - indicates that the demand detector is ready to detect, and shall exit the Metering state when it has failed. .
29.6.2	R	Local Traffic Responsive Ramp Metering: Operates each ramp individually using traffic data from detectors located on the entrance ramp and the adjacent mainline. The controller determines and adjusts the ramp metering rate based on occupancy, speed and/or volume data collected by the detectors.	X					NTCIP 1207 Traffic Responsive operations configurable to controller from central.
29.6.3	R	Systemwide Traffic Responsive Ramp Metering: Operates a group of ramp meters based on traffic conditions for the entire mainline segment containing the selected ramps and all vehicle detectors.	X					iNET ATMS fully meets this requirement.
29.7	R	The ATMS must include a systemwide traffic responsive ramp metering algorithm with at least 8 dynamic metering rates. Specific capabilities of the algorithm are stated in the following sub requirements:	X					iNET ATMS fully meets this requirement.

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29.7.1	R	Activate and deactivate ramp metering when a user-defined maximum and minimum mainline occupancy threshold are met, respectively.	X					iNET ATMS fully meets this requirement.
29.7.2	R	Activate a queue flush when a user-defined detector senses queued vehicles.	X					This is part of controller configuration.
29.7.3	R	Automatically adjust ramp metering rates based on ramp queue lengths to prevent vehicles from backing up beyond the ramp limits.	X					Queue configuration is by count or by present occupancy.
29.7.4	R	Provide a scheduling mechanism to automatically deploy a minimum of 8 traffic responsive (dynamic) metering rates.	X					iNET ATMS fully meets this requirement.
29.7.5	R	Utilize detector data processed by ramp meter controllers to monitor traffic and analyze occupancy and volume for use within the ramp meter algorithm.	X					iNET ATMS fully meets this requirement.
29.7.6	R	Automatically adjust ramp metering rates based on mainline traffic.	X					iNET ATMS fully meets this requirement.
29.7.7	R	Provide the ability to program user defined rules based on ramp and mainline detector data (e.g., queue length, occupancy, and speed). The input data must be separated into category thresholds (i.e., the system may divide speed into categories of very slow, slow, medium, fast, and very fast) that adjust ramp metering rates when the user-defined rules are met (i.e., if mainline speed upstream is fast and mainline speed downstream is slow, then the ramp meter cycle time is xx seconds).			X			Current category thresholds are based on actual values. Customization will be made to set property domains for the categories mentioned and set current rule-based selection to utilize those.
29.7.8	R	Provide the ability to group ramp meters for the purposes of coordination, monitoring, and control. Groups must be capable of including any number of meters between one and the total number of meters in the system.	X					Currently ramp meters are grouped automatically by corridor and direction.
29.7.9	R	Provide the ability to program rules that apply across a group of ramp meters that allow all ramp	X					The group is the corridor no changes needed. If the group is customizable then that group configuration will be in addition to corridor configurations.

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		meters within the group to respond to group wide conditions.						
29.7.10	R	Provide an algorithm that dynamically adjusts ramp metering rates within a defined group based on group wide conditions. The algorithm must allow minimum and maximum operational parameters that are adjustable.	X					This requirement is fully met.
29.8	R	Users must be able to simultaneously use different metering strategies on different corridors.		X				Some configuration will be required to meet this requirement.
29.9	R	The ATMS must adapt its response plan recommendations and activations based on the presence of any failed ramp metering devices (detectors, signal heads, controllers) in the metered area if these failures will affect the performance of the metering operation.	X					iNET ATMS fully meets this requirement.
29.10	R	The ATMS must activate synchronized flashing beacons on “RAMP METERED WHEN FLASHING” signs when ramp control is activated via the ramp meter field controller. Beacons must remain active until ramp control deactivates.	X					iNET ATMS fully meets this requirement. It is a function of controller
29.11	R	The ATMS must deactivate flashing beacons on “RAMP METERED WHEN FLASHING” signs when ramp control deactivates via the ramp meter field controller. Beacons must remain inactive until ramp control activates.	X					iNET ATMS fully meets this requirement.
29.12	R	The ATMS must activate, via the ramp meter field controller, flashing synchronized yellow indications continuously on all signal heads when ramp control is not active.	X					iNET ATMS fully meets this requirement.
29.13	R	The ATMS must be capable of configuring the ramp meter system to transition from a flashing yellow phase to a solid yellow phase to a solid red phase.	X					iNET ATMS fully meets this requirement. Transitions are defined by NTCIP 1207 Pre-meter non-green (Yellow flash is option in NTCIP 1207v2). Transition to startup yellow is available when rmcStartYellow is configured.
29.14	R	The ATMS must be capable of configuring, activating, and operating four ramp meter signals on the same	X					iNET ATMS fully meets this requirement.

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		ramp, two for each lane, in conjunction with each other, alternating green signals for each lane.						
29.15	R	The ATMS must provide a real-time indication of meter operation and current metering rate to Traffic Operations Specialists.	X					iNET ATMS fully meets this requirement. Controller chosen must have the capability to provide real-time information at a rate consistent with the unit's real-time operation rate.
29.16	R	The ATMS must operate with Type 2070 ramp meter controllers using the NTCIP 1207 v02 communications protocol.	X					iNET ATMS fully meets this requirement.
29.17	R	The ATMS Contractor may either use the stock State ramp meter controller firmware or provide and install firmware on the State ramp meter controllers, which is compatible with its back-end system to operate System Traffic Responsive Ramp Metering.	X					iNET ATMS fully meets this requirement.
29.18	R	The ATMS must provide the ability to upload/download ramp meter controller data (i.e., from central to local and from local to central) to specific ramp meters and/or groups of ramp meters. The ATMS must require confirmation from the user prior to uploading or downloading controller data.			X			Configurations for individual controllers are present. Group configuration uploads would be a new feature.
29.19	O	The ATMS should provide the ability to restore previous versions of controller databases from an archive.			X			This functionality would require an additional configuration management option to save current configuration when changed by version number and date and allow for it to be restored and uploaded to the controller.
29.20	R	The system must be capable of running a fixed-rate metering program based on a time-of-day schedule if local detection fails.	X					Based on NTCIP 1207 Command Source Priority. If configured CIT (central, interconnect, time based), when central control terminates for any reason, time based will take over (given there is no interconnected master(not typical) driving the controller).
29.21	R	The ATMS must record the presence of queued vehicles at each vehicle detection location on the ramp and the timeframe from which they are formed/detected until the queue has dissipated.	X					iNET ATMS fully meets this requirement.
30		System: Flex Route						
30.1	R	The ATMS must be able to operate Flex Route corridors using a combination of the following functions: dynamic		X				iNET provides all of the capabilities to meet this requirement but some system configurations will be required.

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		lane control, dynamic shoulder use, variable speed advisories (VSA), queue warning, and ramp metering.						
30.2	R	The ATMS must not prohibit the DMS (Small and Large), CCTV cameras, and vehicle detectors integrated as part of a Flex Route system from being controlled and viewed by other user interfaces and modules within the ATMS software.	X					iNET ATMS fully meets this requirement.
30.3	R	The ATMS must include a “corridor schematic view” displaying all devices and gantries within the Flex Route limits in a logical layout based on field placement (e.g., north to south). The map must be designed such that overlapping icons can be individually selected at any zoom level. The icons must display each device’s operational status and individual LCS messages. The corridor schematic view does not need to be geographically correct.	X					iNET ATMS fully meets this requirement.
31		System: Active Transportation and Demand Management (ATDM)						
31.1	R	The ATMS must be able to operate ATDM corridors using a combination of the following functions: variable speed advisories (VSA), queue warning, traveler information (e.g., alternate travel times), and automated incident detection.	X					iNET ATMS fully meets this requirement.
31.2	R	The ATMS must include a “corridor schematic view” displaying all devices within the ATDM limits in a logical layout based on field placement (e.g., north to south). The map must be designed such that overlapping icons can be individually selected at any zoom level. The icons must display each device’s operational status. The corridor schematic view does not need to be geographically correct.	X					iNET ATMS fully meets this requirement.

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31.3	R	The ATMS must allow a Traffic Operations Specialist to change the parameters associated with an individual sign, or a group of signs from the ATDM corridor schematic view.	X					iNET ATMS fully meets this requirement.
G		Systems						
32		Border Wait Time System						
32.1	O	The ATMS should interface with the border wait time system which uses traffic detection devices and algorithms to estimate the amount of time vehicles approaching a border crossing can expect to "wait" before crossing the border, at any given time. The two anticipated systems are listed below:	X					iNET ATMS fully meets this requirement. The current iNET ATMS for MDOT has this module implemented and configured.
32.1.1	O	The Blue Water Bridge (BWB) border crossing incorporates a hybrid system using Bluetooth and loop detectors to measure wait times for passenger vehicles and commercial traffic. This hybrid wait time measurement system detects wait times from the end of the queue to the arrival at the primary inspection booth. This information is conveyed on DMS boards.		X				Border Wait system module will be configured in iNET ATMS to interface with the BWB system. Contractor does not anticipate this to be a major task as the module is in place. All the efforts will revolve around configuration and Systems Testing.
32.1.2	O	The Gordie Howe International Bridge (GHIB) is currently under construction with an anticipated opening in 2024, with a planned border wait time system.		X				This will also require system configurations and Testing to meet this requirement.
33		Parking and Information Management System (PIMS)						
33.1	R	The ATMS must obtain parking availability information (e.g., available parking spaces) from the PIMS interface for privately owned sites.	X					iNET ATMS fully meets this requirement. The current iNET ATMS for MDOT has this module implemented and configured.
33.2	R	The ATMS must obtain and keep an internal count of the reported available/occupied parking availability from field data loggers reporting in/out counts. Internal count must	X					iNET ATMS fully meets this requirement. PIMS module supports this.

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		be bounded by configurable site specific maximum and minimum values.						
33.3	R	The ATMS must have the ability to associate one or more DMS and dynamic display panels to a specific PIMS site.	X					iNET ATMS fully meets this requirement.
33.4	R	The ATMS must have the ability to automatically post and update parking lot availability information on a per site basis to associated DMS and dedicated dynamic display panels.	X					iNET ATMS fully meets this requirement.
33.5	R	The ATMS must provide a user configurable parking lot striped space value on a per site basis.	X					iNET ATMS fully meets this requirement.
33.6	R	The ATMS must post and update the parking lot availability count on a per site basis, but never post more than the striped spaces value.	X					iNET ATMS fully meets this requirement.
33.7	R	The ATMS must provide a user configurable low threshold value on a per site basis.	X					iNET ATMS fully meets this requirement.
33.8	R	The ATMS must post a “LOW” message, in lieu of the numeric count, when the user defined low threshold is met and/or exceeded.	X					iNET ATMS fully meets this requirement.
33.9	O	The ATMS shall provide the trending state based on calculating vehicle flow over time by using an availability delta (%Deltan), expressed as a percentage, where “n” marks the elapsed time since the measured interval in minutes. %Deltan = [(Availabilityn – Availabilityn-5) / Capacity]. Refer to Attachment 9 Regional TPIMS Data Exchange v2.2 for further definition.	X					iNET ATMS fully meets this requirement.

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33.10	O	The ATMS shall base the threshold for the trend states based on the %Flow calculation (%Flow = %Delta0 + %Delta5 + %Delta10 + %Delta15 + %Delta20 + %Delta25) with the following classifications, “CLEARING”, “STEADY”, and “FILLING”. Refer to Attachment 9 Regional TPIMS Data Exchange v2.2 for further definition.	X					iNET ATMS fully meets this requirement.
33.11	O	The thresholds for CLEARING, STEADY, and FILLING shall be user adjustable per site, as individual sites may operate uniquely and require independent adjustments.	X					iNET ATMS fully meets this requirement.
33.12	R	The ATMS must provide the ability for the user to manually override the current availability count (amplitude verification check) and track when parking counts are manually overridden.	X					iNET ATMS fully meets this requirement.
33.12.1	R	The ATMS log must distinguish between manual overrides and system produced values for verification.			X			The system currently does not have the capability to distinguish between manual overrides and system produced values. Software customization will be made to make this distinction between the two and for the ATMS logs to clearly output that info for verification.
34		Integrated Corridor Management (ICM) System						
34.1	R	The ATMS must have the ability to alert drivers of an incident and provide alternate routes using adjacent arterial corridors. Trailblazer signs (dynamic display panels) must be activated by the ATMS displaying a directional arrow to guide motorists through the alternate route.	X					iNET ATMS fully meets this requirement. The current iNET ATMS for MDOT has this module implemented and configured.
34.2	R	The ATMS must provide the ability to manage approved ICM Trailblazer Signs.	X					iNET ATMS fully meets this requirement.
35		Warning Signs and Indicators						

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35.1	R	The ATMS must have the ability to integrate and manage the activation and deactivation of warning indicators/signs, such as flashing beacons, LED border signs, and BOS through remote connection with the local contact closure and programmable logic controller (PLC). The subject warning indicators/signs are typically part of Over-height Vehicle Detection System (OHVDS), Bridge Deck Warning System (BDWS), Highway Advisory Radio (HAR), wrong way driving system (WWDS), and other standalone systems.		X				iNET can communicate with the listed field devices in the requirement that implement a standard interface such as Modbus TCP, SNMP, HTTP, REST, OPC/UA etc. Some system configurations will be required. However, for non- standard interfaces, customization will be required.
35.2	R	The ATMS must be capable of showing the sign or structure that the warning indicators are mounted to and identify that the warning indicators were activated for that sign/structure.	X					Fully meets the requirement. iNET has full capability to display signs that the warning indicators are mounted to.
35.3	R	The ATMS must record warning indicator activations and deactivations including location, roadway direction, date, time, and condition triggering the activation/deactivation.	X					iNET records all activities within ATMS and fully meets this requirement.
35.4	R	The ATMS must record the cumulative time the warning indicator remains on per activation.			X			Customization will be made.to record the cumulative time in the ATMS.
36		Curve Warning System						
36.1	R	The ATMS must record curve warning system activations including location, roadway direction, date, and time. Activations may include DMS messages, flashing beacons, and LED border signs.	X					iNET ATMS already has this module in the current QA system. It is scheduled to go live soon

SCHEDULE B – PRICING

Description		Unit of Measure	Bid Price	Anticipated Quantity	Extended Price
General Project Management - Initial Contract Period (Five Year Cost)		Job	$102,020	1	$102,020
Project Management Documentation		Job	$68,300	1	$68,300
Software Design Documentation		Job	$52,942	1	$52,942
Licensing and Hosting (Subscription)*		Year	$61,000	4.5	$244,000
Licensing and Hosting (Perpetual)* New modules – Ramp Metering and AVL		Job	$50,000	2	$100,000
Software Development, Configuration, and Testing		Job	$915,618	1	$915,618
Solution Integration and Acceptance		Job	$461,112	1	$461,112
Training (Five Year Cost)		Job	$113,045	1	$113,045
Operations and Maintenance - All requirements will be completed in the first 12 months of the contract.		Year	$143,283	4	$573,132
Total (Initial Five-Year Term)					**$2,630,168**
Annual Project Management - Contract Renewals - Years 6-10		Year	$175,904	5	$879,522
Annual ATMS License and Hosting - Contract Renewals - Years 6-10		Year	$60,000	5	$300,000
Annual ATMS Support & Maintenance - Contract Renewals - Years 6-10		Year	$10,635	5	$53,175
Total (Contract Renewal Costs)			**$246,539**		**$1,232,697**
5.16	The ATMS should provide the ability to turn off auto refresh when viewing a table with live data.	Job	$16,407	1	$16,407
6.14.5	Color scheme (i.e., light vs dark)	Job	$8,320	1	$8,320
6.15	The ATMS should provide the ability to create a map view on demand by geo-fencing an area (graying out the area outside of the selected area) for use in managing incidents and/or events.	Job	$8,320	1	$8,320
9.1	The ATMS should be able to record and archive CCTV camera streaming video of a rolling or continuous user defined period.	Job	$43,502	1	$43,502
9.15	The ATMS must provide a means of identifying if a CCTV camera is being transmitted via cellular modem.	Job	$13,066	1	$13,066
11.8	The ATMS should provide the ability to manually flag suspect vehicle detection devices and data.	Job	$35,627	1	$35,627

11.9	The ATMS should provide a mechanism fo r users to exclude suspect flagged vehicle detector data from historical reports, analysis, and decision-making without deleting the data. If a user does not choose to exclude the suspect data, it should be included in the report.	Job	$31,736	1	$31,736
11.1	The ATMS should provide a clear indicatio n when historical or interpolated vehicle detector data is used in order to easily identify the malfunctioning sensors for maintenance.	Job	$30,388	1	$30,388
11.11	The ATMS system should graphically display the lanes being detected along with lane-by-lane identifiers at each vehicle detector location that aligns with report outputs.	Job	$23,918	1	$23,918
11.12	The ATMS should capture and display wrong way driving detection events detected by vehicle detection systems, by direction and lane for of all lanes in each direction at vehicle detector locations.	Job	$25,945	1	$25,945
13.18	The ATMS must be capable of monitoring traffic conditions (e.g., volume and speed) within a defined proximity to an existing event and recommend adjustments to response plans associated with the subject event if conditions change. For example, if vehicle speeds are less than XX MPH for a user-defined duration within a special event area post a message to an upstream DMS.	Job	$26,203	1	$26,203
13.31	The ATMS should have the ability to automatically generate an event based upon SSP remote-entered data pertaining to vehicle assists, alerts for lane closures and speed-reductions.	Job	$17,883	1	$17,883
14.7	The ATMS should provide a map-based layer with color-coded DMS travel time messages in green, yellow or red based upon a comparison of actual and available historical travel times.	Job	$17,883	1	$17,883
15.16	The ATMS should remove an alert pop-up that requires action from all other user accounts and workstations once a Traffic Operations Specialist acknowledges.	Job	$19,126	1	$19,126

15.2	The ATMS should alert users when current traffic conditions (e.g., speed, volume) exceed historical values by a user-defined threshold. For example, if a subject segment typically averages 35 MPH between 4-5pm, provide an alert when average speeds drop below 25 MPH for more than five minutes between 4-5pm.	Job	$44,206	1	$44,206
18.5	The ATMS should provide the ability to generate reports which compares current vs. historical travel conditions. Historical travel condition data should be available as defined in the MDOT ITS/TOC Retention Schedule.	Job	$26,016	1	$26,016
18.12	The ATMS should provide the ability to provide call-tracking reports.	Job	$30,940	1	$30,940
18.2	The ATMS should be capable of assigning a customizable report footer that specifies data classification (e.g., Public, Internal, Confidential, Restricted).	Job	$21,645	1	$21,645
19.1	The ATMS should provide call-tracking capable of storing contact name, organization, and phone which can be referenced separately of an event.	Job	$37,326	1	$37,326
19.2	Call-tracking should be capable of recording call types (in-bound and out-bound), with the ability to populate free-text notes and link calls to Events. Call types should be editable by an authorized user.	Job	$21,986	1	$21,986
19.3	The Traffic Operations Specialist should be able to select the action they or others have taken with-in the call-tracking functionality, such as initiate an event, dispatch SSP. Action types should be editable by an authorized user.	Job	$9,376	1	$9,376
19.4	The ATMS should provide call-tracking capable of interfacing with Voice over Internet Protocol (VOIP) phone systems with the ability to populate incoming and outgoing call information into the call log without action by the Traffic Operations Specialist, such as the phone number and time the call was made or received. The State of Michigan currently utilizes the Cisco Unified Communications Manager version 12.5 for its VOIP phone systems.	Job	$35,977	1	$35,977
19.5	The call-tracking functionality should store external contact information within the event for incoming and outgoing calls.	Job	$0	1	With 19.4

19.6	The call-tracking functionality should be search-able/have the ability to filter the logged information from the production environment, as well as in the archived environment. All fields entered should be search/filterable.	Job	$0	1	With 19.4
28.19	The ATMS should provide the ability to restore previous versions of controller databases from an archive.	Job	$22,079	1	$22,079
3.10.1	The ATMS must provide the ability to add multiple devices in batches within the ATMS without Contractor support.	Job	$7,744	1	$7,744
6.23.1	The ATMS speed layer should be color coded based on speed thresholds that are system configurable based on deviation from historical average speeds.	Job	$7,744	1	$7,744
8.24.2	Automatically update location based on GPS of the PCMS unit	Job	$3,098	1	$3,098
9.13	The ATMS should have the ability to display video processed from other State systems, such as traffic signal and ESS CCTV cameras.	Job	$21,120	1	$21,120
15.6.2	Configure count and persistence thresholds, such as “alert after condition true for 5 minutes” or “alert after condition occurs 5 times in 10 minutes”	Job	$7,744	1	$7,744
15.15	The ATMS should provide an alert if an event has been open for a user configurable time threshold without any activity (stale). The alert should be provided to all users and not limited to the user who initiated the event.	Job	$7,744	1	$7,744
17.5	The ATMS should have the ability to provide access to the dashboards while on the internal network without being logged into the ATMS.	Job	$7,744	1	$7,744
24.5	The ATMS should provide the ability to view dashcam footage or snapshots in real-time as provided by AVL vehicles integrated into the ATMS.	Job	$7,744	1	$7,744
31.1.1	The Blue Water Bridge (BWB) border crossing incorporates a hybrid system using Bluetooth and loop detectors to measure wait times for passenger vehicles and commercial traffic. This hybrid wait time measurement system detects wait times from the end of the queue to the arrival at the primary inspection booth. This information is conveyed on DMS boards.	Job	$4,646	1	$4,646

31.1.2	The Gordie Howe International Bridge (GHIB) is currently under construction with an anticipated opening in 2024, with a planned border wait time system. (If same as BWB)	Job	$4,646	1	$4,646
	Additional Training Session	Ea.	$1,680	1	$1,680
	Integration of new manufacturer of existing device type (NTCIP)	Ea.	$7,200	1	$7,200
	Integration of new non NTCIP manufacturer of existing device type cannot be estimated with no details on the interface but it is typically less than $20K				
	Total (Optional Costs)				**$684,855**

Req #	**Optional Items That Are Included With Base Deployment With No Additional Cost**
1.5	The ATMS should be able to retrieve stored data to simulate or replay operation of the system in the test environment to support testing, operator training, and demonstrations to stakeholders.
2.4	The ATMS must include the ability to communicate with other centers via ITE's Traffic Management Data Dictionary (TMDD) Standard (version 3.1)
3.10.2	The ATMS must provide the ability to assign device input fields as required or optional, where optional fields can be left blank and will not prohibit the device from being added to the ATMS.
3.11	The ATMS must provide the ability to edit device within the ATMS without Contractor support.
5.15	The ATMS should provide the ability to create tabular displays by selecting devices and associated data fields to be included in the tabular display.
5.17	The ATMS should automatically adjust dropdown menus based on the previously selected information. For example, if the user defines the MDOT region, the subsequent County dropdown should only provide counties within the specified region.
5.19	The ATMS should provide the ability to build corridor schematics displaying views of all devices within the corridor limits in a logical layout based on field placement (e.g., west to east). The schematic view should be designed such that overlapping icons can be individually selected without modifying the devices GPS location. The icons must display each device's operational status within the corridor limits.
5.19.1	The ATMS must provide Traffic Operations Specialists the ability to view current DMS message status for every DMS within a project corridor/group in a single Corridor View window simultaneously (scrolling may be needed if scale and screen size limit legibility).
6.5	The ATMS map should have an interactive (point and click) distance measurement tool.
6.14	The ATMS map must provide the ability for individual users to configure, save, and recall the following map settings:
6.14.3	View prior to last logout
6.14.4	Layers (i.e., on vs off)
	The ATMS must provide the ability to configure map settings administratively including the ability to:
6.18.2	Change and configure device icon images
	The ATMS must provide the following functionality for PCMS:
8.24.1	View PCMS health status such as pixel failures and the battery level
8.24.3	Manually override the location of a PCMS unit

8.27	The ATMS should provide the ability to communicate and authenticate messages to a DMS through an API and through a Contractor owned back-end interface.
9.2.8	Continuously sequencing a CCTV camera through user-defined camera presets.
9.3.1	The States preference is to pan and tilt a CCTV through clicking and dragging a cursor on the screen.
9.5.1	The States preference is to zoom a CCTV using the mouse scroll wheel.
9.9	The ATMS should provide the ability to take and save snapshots from video feeds or camera layouts to a database accessible to all users.
9.9.1	The ATMS should provide the ability to export a snapshot to an email, text, tweet, or other communication medium.
9.11	The ATMS must provide the following functionality for portable CCTV cameras:
9.11.1	Automatically update location based on GPS of the portable CCTV unit
9.11.2	Manually override the location of a portable CCTV unit.
10.1	ESS are currently managed through the State's Weather Feed. Contractor to indicate if their ATMS solution has the capability of integrating ESS and associated sensors via NTCIP 1204.
11.1	The ATMS must provide the ability to add, remove, modify, disable, and manage vehicles detectors, including but not limited to the following:
11.1.2	Video
11.1.3	Inductive loop
11.1.4	In-Pavement Wireless detector
11.7	The ATMS should be capable of automatically performing data validation checks (e.g., missing data, anomalies, erratic, etc.) for MVDS. If data does not meet quality pre-defined thresholds, sensor data should be flagged as failed and removed from the algorithm until data quality improves, at which time is included back into the algorithm.
12.27.1	The ATMS should auto-filter available response plans by geographical coverage area (i.e., MDOT Region).
12.58	Once a sensor is flagged as failed (by ATMS or a TOC Traffic Operations Specialist), ATMS should exclude the data produced by that sensor from the algorithm. After the sensor has been repaired or re-establishes power/communications, the sensor should be returned to normal operating status (by ATMS or a TOC Traffic Operations Specialist depending on which method the sensor failed) and included in the algorithm.
13.38	The ATMS must provide automated/recommended detours based on the event type, roadway type, and severity assigned.
14.8	The ATMS should provide the capability to ingest travel times calculated from the State's third-party data provider.
15.5.1	The ATMS should provide the ability to turn off alerts for disabled devices.
18.27	The ATMS should provide the ability to compress and download a report.
31.1	The ATMS should interface with the border wait time system which uses traffic detection devices and algorithms to estimate the amount of time vehicles approaching a border crossing can expect to "wait" before crossing the border, at any given time. The two anticipated systems are listed below:
32.9	The ATMS shall provide the trending state based on calculating vehicle flow over time by using an availability delta (%Deltan), expressed as a percentage, where "n" marks the elapsed time since the measured interval in minutes. %Deltan = [(Availabilityn – Availabilityn-5) / Capacity].
32.10	The ATMS shall base the threshold for the trend states based on the %Flow calculation (%Flow = %Delta0 + %Delta5 + %Delta10 + %Delta15 + %Delta20 + %Delta25) with the following classifications, "CLEARING", "STEADY", and "FILLING".
32.11	The thresholds for CLEARING, STEADY, and FILLING shall be user adjustable per site, as individual sites may operate uniquely and require independent adjustments.

Postproduction Warranty. The Contractor must provide a 90 calendar days postproduction warranty at no cost to the State. The postproduction warranty will meet all requirements of the contract, including all Support Services identified in Schedule D.

Rate Card for Ancillary Professional Services.

Job Classification	Experience	Hourly Rate Loaded
Contractor Project Manager	5+ years of ATMS Project Management experience	$317
Contractor Security Officer	5+ years of ATMS Security experience	$247
ATMS Integration/Transition	5+ years of ATMS development experience	$182
ATMS Integration/Transition	2 to 5 years of ATMS development experience	$112
ATMS Integration/Transition	0 to 2 years of ATMS development experience	$101
ATMS Enhancement Lead	5+ years of ATMS enhancement design experience	$247
ATMS Enhancement Lead	2 to 5 years of ATMS development experience	$138
ATMS Enhancement Lead	0 to 2 years of ATMS development experience	$112
ATMS Maintenance/Support	5+ years of ATMS user and system support experience	$182
ATMS Maintenance/Support	2 to 5 years of ATMS development experience	$112
ATMS Maintenance/Support	0 to 2 years of ATMS development experience	$101
ATMS Trainer	5+ years of ATMS training experience	$177
ATMS Trainer	2 to 5 years of ATMS development experience	$112
Senior Developer	5+ years of experience	$208
Lead Developer	10+ years of experience	$247
Chief Engineer	15+ years of experience	$283

Open Source or Third Party Products

Open source or third-party products that include a separate licensing fee and will be used in connection with the proposed Solution.

Product	Price
Wowza	$24,000
JDK	No changes from current, no added cost
Dojo Toolkit	No changes from current, no added cost
Geoserver	No changes from current, no added cost
Wildfly application server	No changes from current, no added cost
Openlayers	No changes from current, no added cost
Apache libraries	No changes from current, no added cost
Commons library	No changes from current, no added cost
Rhino libraries	No changes from current, no added cost
XMLBeans	No changes from current, no added cost
JAXB library	No changes from current, no added cost
LOG4J library	No changes from current, no added cost
Oracle relational databases	No changes from current, so no added cost. In state virtual environment. Assuming continued to be provided by state
Hibernate	No changes from current, no added cost
JSPELL	No changes from current, no added cost

1. Additional Pricing Terms

The Contractor is encouraged to offer quick payment terms. The number of days must not include processing time for payment to be received by the Contractor's financial institution.

Quick payment terms: ___0___ % discount off invoice if paid within _____ days after receipt of invoice.

If Contractor reduces its prices, or offers a lower price to any other entity, private or public, for any of the software or services during the term of this Contract, the State shall have the immediate benefit of such lower prices for new purchases. Contractor shall send notice to the State's Contract Administrator with the reduced prices within fifteen (15) Business Days of the reduction taking effect.

Travel and Expenses
The State does not pay for overtime or travel expenses.

SCHEDULE C - INSURANCE SCHEDULE

Required Coverage.

1.1 **Insurance Requirements.** Contractor, at its sole expense, must maintain the insurance coverage identified below. All required insurance must: (a) protect the State from claims that may arise out of, are alleged to arise out of, or otherwise result from Contractor's or a subcontractor's performance; (b) be primary and non-contributing to any comparable liability insurance (including self-insurance) carried by the State; and (c) be provided by a company with an A.M. Best rating of "A-" or better, and a financial size of VII or better.

Required Limits	Additional Requirements
Commercial General Liability Insurance	
Minimal Limits: $1,000,000 Each Occurrence $1,000,000 Personal & Advertising Injury $2,000,000 Products/Completed Operations $2,000,000 General Aggregate Limit	Contractor must have their policy endorsed to add “the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents” as additional insureds using endorsement CG 20 10 11 85, or both CG 20 10 12 19 and CG 20 37 12 19.
Automobile Liability Insurance	
If a motor vehicle is used in relation to the Contractor's performance, the Contractor must have vehicle liability insurance on the motor vehicle for bodily injury and property damage as required by law.	
Workers' Compensation Insurance	
Minimal Limits: Coverage according to applicable laws governing work activities.	Waiver of subrogation, except where waiver is prohibited by law.
Employers Liability Insurance	
Minimal Limits: $500,000 Each Accident $500,000 Each Employee by Disease $500,000 Aggregate Disease.	
Privacy and Security Liability (Cyber Liability) Insurance	
Minimal Limits: $1,000,000 Each Occurrence $1,000,000 Annual Aggregate	Contractor must have their policy cover information security and privacy liability, privacy notification costs, regulatory defense and penalties, and website media content liability.

1.2 If any of the required policies provide **claims-made** coverage, the Contractor must: (a) provide coverage with a retroactive date before the Effective Date of the Contract or the beginning of Contract Activities; (b) maintain coverage and provide evidence of coverage for at least three (3) years after completion of the Contract Activities; and (c) if coverage is cancelled or not renewed, and not replaced with another claims-made policy form with a retroactive

date prior to the Contract Effective Date, Contractor must purchase extended reporting coverage for a minimum of three (3) years after completion of work.

1.3 Contractor must: (a) provide insurance certificates to the Contract Administrator, containing the agreement or delivery order number, at Contract formation and within twenty (20) calendar days of the expiration date of the applicable policies; (b) require that subcontractors maintain the required insurance contained in this Section; (c) notify the Contract Administrator within five (5) business days if any insurance is cancelled; and (d) waive all rights against the State for damages covered by insurance. Failure to maintain the required insurance does not limit this waiver.

1.4 This Section is not intended to and is not to be construed in any manner as waiving, restricting or limiting the liability of either party for any obligations under this Contract (including any provisions hereof requiring Contractor to indemnify, defend and hold harmless the State).

SCHEDULE D - SERVICE LEVEL AGREEMENT

IF THE SOFTWARE IS STATE HOSTED, then the following applies:

The parties agree as follows:

1. Definitions. For purposes of this Schedule, the following terms have the meanings set forth below. All initial capitalized terms in this Schedule that are not defined in this Schedule shall have the respective meanings given to them in the Contract Terms and Conditions.

"**Contact List**" means a current list of Contractor contacts and telephone numbers set forth in the attached **Schedule D – Attachment 1** to this Schedule to enable the State to escalate its Support Requests, including: (a) the first person to contact; and (b) the persons in successively more qualified or experienced positions to provide the support sought.

"**Critical Service Error**" has the meaning set forth in the Service Level Table.

"**Error**" means, generally, any failure or error referred to in the Service Level Table.

"**First Line Support**" means the identification, diagnosis and correction of Errors by the State.

"**High Service Error**" has the meaning set forth in the Service Level Table.

"Low Service Error" has the meaning set forth in the Service Level Table.

"**Medium Service Error**" has the meaning set forth in the Service Level Table.

"**Resolve**" and the correlative terms, "**Resolved**", "**Resolving**" and "**Resolution**" each have the meaning set forth in **Section 2.4**

"**Service Credit**" has the meaning set forth in **Section 3.1**

"**Second Line Support**" means the identification, diagnosis and correction of Errors by the provision of (a) telephone, and email, and remote application support assistance by a qualified individual on the Contact List and remote application support, or (b) on-site technical support at the State's premises by a qualified individual on the Contact List.

"**Service Levels**" means the defined Error and corresponding required service level responses, response times, Resolutions and Resolution times referred to in the Service Level Table.

"**Service Level Table**" means the table set out in **Section 2.4**

"**State Cause**" means any of the following causes of an Error: (a) a State server hardware problem; (b) a desktop/laptop hardware problem; or (c) a State network communication problem.

"**State Systems**" means the State's information technology infrastructure, including the State's computers, software, databases, electronic systems (including database management systems) and networks.

"**Support Hours**" means 24 hours a day, 7 days a week, 365 days a year.

"**Support Period**" means the period of time beginning 90 days after the date the Software has entered full production mode and ending on the date the Contract expires or is terminated.

"**Support Request**" has the meaning set forth in **Section 2.2**.

2. Support Services. The State will provide First Line Support prior to making a Service Request for Second Line Support. Contractor shall perform all Second Line Support and other Support Services during the Support Hours throughout the Support Period in accordance with the terms and conditions of this Schedule and the Contract, including the Service Levels and other Contractor obligations set forth in this **Section 2**.

2.1 Support Service Responsibilities. Contractor shall:

(a) provide unlimited telephone support during all Support Hours;

(b) respond to and Resolve all Support Requests in accordance with the Service Levels;

(c) provide unlimited remote Second Line Support to the State during all Support Hours;

(d) provide on-premise Second Line Support to the State if remote Second Line Support will not Resolve the Error; and

(e) provide to the State all such other services as may be necessary or useful to correct an Error or otherwise fulfill the Service Level requirements, including defect repair, programming corrections and remedial programming.

2.2 Support Requests. Once the State has determined that an Error is not the result of a **State Cause**, the State may request Support Services by way of a Support Request. The State shall classify its requests for Error corrections in accordance with the support request classification and definitions of the Service Level Table set forth in **Section 2.4** (each a "**Support Request**"). The State shall notify Contractor of each Support Request by e-mail, telephone, or other approved ticketing system. The State shall include in each Support Request a description of the reported Error and the time the State first observed the Error.

2.3 State Obligations. The State shall provide the Contractor with each of the following to the extent reasonably necessary to assist Contractor to reproduce operating conditions similar to those present when the State detected the relevant Error and to respond to and Resolve the relevant Support Request:

(i) if not prohibited by the State's security policies, remote access to the State Systems, and if prohibited, direct access at the State's premises;

(ii) output and other data, documents and information, each of which is deemed the State's Confidential Information as defined in the Contract; and

(iii) such other reasonable cooperation and assistance as Contractor may request.

2.4 Service Level Table. Response and Resolution times will be measured from the time Contractor receives a Support Request until the respective times Contractor has (a) responded to that Support Request, in the case of response time and (b) Resolved that Support Request, in the case of Resolution time. "**Resolve**", "**Resolved**", "**Resolution**" and correlative capitalized terms mean, with respect to any particular Support Request, that Contractor has corrected the Error that prompted that Support Request and that the State has confirmed such correction and its acceptance of it in writing. Contractor shall respond to and Resolve all Support Requests within the following times based on the State's designation of the severity of the associated Error, subject to the parties' written agreement to revise such designation after Contractor's investigation of the reported Error and consultation with the State:

Support Request Classification	Definition	Service Level Metric (Required Response Time)	Service Level Metric (Required Resolution Time)
Critical Service Error	(a) Issue affecting entire Software system or single critical production function; (b) Software down or operating in materially degraded state; (c) Data integrity at risk; (d) Material financial impact; (e) Widespread access interruptions: or (f) Classified by the state as a Critical Service Error	Contractor shall acknowledge receipt of a Support Request within thirty (30) minutes.	Contractor shall Resolve the Support Request as soon as practicable and no later than four (4) hours after Contractor's receipt of the Support Request. If the Contractor Resolves the Support Request by way of a work-around accepted in writing by the State, the support classification assessment will be reduced to a High Service Error.

Support Request Classification	Definition	Service Level Metric (Required Response Time)	Service Level Metric (Required Resolution Time)
High Service Error	(a) A Critical Service Error for which the State has received, within the Resolution time for Critical Service Errors, a work-around that the State has accepted in writing; or (b) Primary component failure that materially impairs Software's performance; (c) Data entry or access is materially impaired on a limited basis; or (d) performance issues of severe nature impacting critical processes	Contractor shall acknowledge receipt of a Support Request or, where applicable, the State's written acceptance of a Critical Service Error work-around, within twenty-four (24) hours.	Contractor shall Resolve the Support Request as soon as practicable and no later than two (2) Business Days after Contractor's receipt of the Support Request or, where applicable, the State's written acceptance of a Critical Service Error work-around.
Medium Service Error	An isolated or minor Error in the Software that meets any of the following requirements: (a) does not significantly affect Software functionality; (b) can or does impair or disable only certain non-essential Software functions; or (c) does not materially affect the State's use of the Software	Contractor shall acknowledge receipt of the Support Request within two (2) Business Days.	Contractor shall Resolve the Support Request as soon as practicable and no later than ten (10) Business Days after Contractor's receipt of the Support Request.
Low Service Error	Request for assistance, information, or services that are routine in nature.	Contractor shall acknowledge receipt of the Support Request	N/A

Support Request Classification	Definition	Service Level Metric (Required Response Time)	Service Level Metric (Required Resolution Time)
		within five (5) Business Days.	

2.5 Escalation. If Contractor does not respond to a Support Request within the relevant Service Level response time, the State may escalate the Support Request to the Contractor Project Manager and State Program Managers, or their designees, and then to the parties' respective Contract Administrators.

2.6 Time Extensions. The State may, on a case-by-case basis, agree in writing to a reasonable extension of the Service Level response or Resolution times.

2.7 Contractor Updates. Contractor shall give the State monthly electronic or other written reports and updates of:

(a) the nature and status of its efforts to correct any Error, including a description of the Error and the time of Contractor's response and Resolution;

(b) its Service Level performance, including Service Level response and Resolution times; and

(c) the Service Credits to which the State has become entitled.

3. Service Credits.

3.1 Service Credit Amounts. If the Contractor fails to respond to a Support Request within the applicable Service Level response time or to Resolve a Support Request within the applicable Service Level Resolution time, the State will be entitled to the corresponding service credits specified in the table below ("**Service Credits**"), provided that the relevant Error did not result from a State Cause.

Support Request Classification	Service Level Credits (For Failure to Respond to any Support Request Within the Corresponding Response Time)	Service Level Credits (For Failure to Resolve any Support Request Within the Corresponding Required Resolution Time)
Critical Service Error	An amount equal to 5% of the then current monthly Support Fee for each hour by which Contractor's response exceeds the required Response time.	An amount equal to 5% of the then current monthly Support Fee for each hour by which Contractor's Resolution of the Support Request exceeds the required Resolution time.
High Service Error	An amount equal to 3% of the then current monthly Support Fee for each Business Day, and a pro-rated share of such percentage for each part of a Business Day, by which Contractor's	An amount equal to 3% of the then current monthly Support Fee for each Business Day, and a pro-rated share of such percentage for each part of a Business Day, by which Contractor's Resolution of the Support Request exceeds the required Resolution time.

Support Request Classification	Service Level Credits (For Failure to Respond to any Support Request Within the Corresponding Response Time)	Service Level Credits (For Failure to Resolve any Support Request Within the Corresponding Required Resolution Time)
	response exceeds the required Response time.	

3.2 Compensatory Purpose. The parties intend that the Service Credits constitute compensation to the State, and not a penalty. The parties acknowledge and agree that the State's harm caused by Contractor's delayed delivery of the Support Services would be impossible or very difficult to accurately estimate as of the Effective Date, and that the Service Credits are a reasonable estimate of the anticipated or actual harm that might arise from Contractor's breach of its Service Level obligations.

3.3 Issuance of Service Credits. Contractor shall, for each monthly invoice period, issue to the State, together with Contractor's invoice for such period, a written acknowledgment setting forth all Service Credits to which the State has become entitled during that invoice period. Contractor shall pay the amount of the Service Credit as a debt to the State within fifteen (15) Business Days of issue of the Service Credit acknowledgment, provided that, at the State's option, the State may, at any time prior to Contractor's payment of such debt, deduct the Service Credit from the amount payable by the State to Contractor pursuant to such invoice.

3.4 Additional Remedies for Service Level Failures. Contractor's repeated failure to meet the Service Levels for Resolution of any Critical Service Errors or High Service Errors, or any combination of such Errors, within the applicable Resolution time set out in the Service Level Table will constitute a material breach under the Contract. Without limiting the State's right to receive Service Credits under this **Section 4**, the State may terminate this Schedule for cause in accordance with terms of the Contract.

4. Communications. In addition to the mechanisms for giving notice specified in the Contract, unless expressly specified otherwise in this Schedule or the Contract, the parties may use e-mail for communications on any matter referred to herein.

SCHEDULE D - Attachment 1 – Contact List

Initial contact:
Preston Judkins - 262-347-9211
Lynn Hurtado - 847-485-1116

First escalation:
Anita Malcolm - 630-390-9068
Julia Solomon Thomas - 847-485-1066

Second escalation:
Ranjit Gopal - 224-234-2516

Project Manager escalation:
Joseph Brahm - 262-391-8056

SCHEDULE E – DATA SECURITY REQUIREMENTS

1. Definitions. For purposes of this Schedule, the following terms have the meanings set forth below. All initial capitalized terms in this Schedule that are not defined in this **Schedule** shall have the respective meanings given to them in the Contract.

"**Contractor Security Officer**" has the meaning set forth in **Section 2** of this Schedule.

"**FedRAMP**" means the Federal Risk and Authorization Management Program, which is a federally approved risk management program that provides a standardized approach for assessing and monitoring the security of cloud products and services.

"**FISMA**" means The Federal Information Security Modernization Act of 2014 (Pub.L. No. 113-283 (Dec. 18, 2014.).

"Hosting Provider" means any Permitted Subcontractor that is providing any or all of the Hosted Services under this Contract.

"**NIST**" means the National Institute of Standards and Technology.

"**PCI**" means the Payment Card Industry.

"**PSP**" or **"PSPs"** means the State's IT Policies, Standards and Procedures.

"**SSAE**" means Statement on Standards for Attestation Engagements.

"**Security Accreditation Process**" has the meaning set forth in **Section 6** of this Schedule

2. Security Officer. Contractor will appoint a Contractor employee to respond to the State's inquiries regarding the security of the Hosted Services who has sufficient knowledge of the security of the Hosted Services and the authority to act on behalf of Contractor in matters pertaining thereto ("**Contractor Security Officer**").

3. Contractor Responsibilities. Contractor is responsible for establishing and maintaining a data privacy and information security program, including physical, technical, administrative, and organizational safeguards, that is designed to:

(a) ensure the security and confidentiality of the State Data;

(b) protect against any anticipated threats or hazards to the security or integrity of the State Data;

(c) protect against unauthorized disclosure, access to, or use of the State Data;

(d) ensure the proper disposal of any State Data in Contractor's or its subcontractor's possession; and

(e) ensure that all Contractor Representatives comply with the foregoing.

The State has established Information Technology (IT) PSPs to protect IT resources under the authority outlined in the overarching State 1305.00 Enterprise IT Policy. In no case will the safeguards of Contractor's data privacy and information security program be less stringent than the safeguards used by the State, and Contractor must at all times comply with all applicable public and non-public State IT policies and standards, of which the publicly available ones are at https://www.michigan.gov/dtmb/0,5552,7-358-82547_56579_56755---,00.html.

This responsibility also extends to all service providers and subcontractors with access to State Data or an ability to impact the contracted solution. Contractor responsibilities are determined from the PSPs based on the services being provided to the State, the type of IT solution, and the applicable laws and regulations.

4. Acceptable Use Policy. To the extent that Contractor has access to the State's IT environment, Contractor must comply with the State's Acceptable Use Policy, see https://www.michigan.gov/documents/dtmb/1340.00.01_Acceptable_Use_of_Information_Technology_Standard_458958_7.pdf. All Contractor Personnel will be required, in writing, to agree to the State's Acceptable Use Policy before accessing State systems. The State reserves the right to terminate Contractor's and/or subcontractor(s) or any Contractor Personnel's access to State systems if the State determines a violation has occurred.

5. Protection of State's Information. Throughout the Term and at all times in connection with its actual or required performance of the Services, Contractor will:

5.1 If Hosted Services are provided by a Hosting Provider, ensure each Hosting Provider maintains FedRAMP authorization for all Hosted Services environments throughout the Term, and in the event a Hosting Provider is unable to maintain FedRAMP authorization, the State, at its sole discretion, may either a) require the Contractor to move the Software and State Data to an alternative Hosting Provider selected and approved by the State at Contractor's sole cost and expense without any increase in Fees, or b) immediately terminate this Contract for cause pursuant to **Section 15.1** of the Contract;

5.2 for Hosted Services provided by the Contractor, maintain either a FedRAMP authorization or an annual SSAE 18 SOC 2 Type II audit based on State required NIST Special Publication 800-53 MOD Controls using identified controls and minimum values as established in applicable State PSPs.

5.3 ensure that the Software and State Data is securely hosted, supported, administered, accessed, and backed up in a data center(s) that resides in the continental United States, and minimally meets Uptime Institute Tier 3 standards (www.uptimeinstitute.com), or its equivalent;

5.4 maintain and enforce an information security program including safety and physical and technical security policies and procedures with respect to its Processing of the State Data that complies with the requirements of the State's data security policies as set forth in this Contract, and must, at a minimum, remain compliant with FISMA and NIST Special Publication 800-53 MOD Controls using identified controls and minimum values as established in applicable State PSPs;

5.5 provide technical and organizational safeguards against accidental, unlawful or unauthorized access to or use, destruction, loss, alteration, disclosure, encryption, transfer, commingling or processing of such information that ensure a level of security appropriate to the risks presented by the processing of State Data and the nature of such State Data, consistent with best industry practice and applicable standards (including, but not limited to, compliance with FISMA, NIST, CMS, IRS, FBI, SSA, HIPAA, FERPA and PCI requirements as applicable);

5.6 take all reasonable measures to:

(a) secure and defend all locations, equipment, systems and other materials and facilities employed in connection with the Services against "malicious actors" and others who may seek, without authorization, to destroy, disrupt, damage, encrypt, modify, copy, access or otherwise use Hosted Services or the information found therein; and

(b) prevent (i) the State and its Authorized Users from having access to the data of other customers or such other customer's users of the Services; (ii) State Data from being commingled with or

contaminated by the data of other customers or their users of the Services; and (iii) unauthorized access to any of the State Data;

5.7 ensure that State Data is encrypted in transit and at rest using FIPS validated AES encryption modules and a key size of 128 bits or higher;

5.8 ensure the Hosted Services support Identity Federation/Single Sign-on (SSO) capabilities using Security Assertion Markup Language (SAML), Open Authentication (OAuth) or comparable State approved mechanisms;

5.9 ensure the Hosted Services implements NIST compliant multi-factor authentication for privileged/administrative and other identified access.

6. Security Accreditation Process. Throughout the Term, Contractor will assist the State, at no additional cost, with its **Security Accreditation Process**, which includes the development, completion and on-going maintenance of a system security plan (SSP) using the State's automated governance, risk and compliance (GRC) platform, which requires Contractor to submit evidence, upon request from the State, in order to validate Contractor's security controls within two weeks of the State's request. On an annual basis, or as otherwise required by the State such as for significant changes, re-assessment of the system's controls will be required to receive and maintain authority to operate (ATO). All identified risks from the SSP will be remediated through a Plan of Action and Milestones (POAM) process with remediation time frames and required evidence based on the risk level of the identified risk. For all findings associated with the Contractor's solution, at no additional cost, Contractor will be required to create or assist with the creation of State approved POAMs, perform related remediation activities, and provide evidence of compliance. The State will make any decisions on acceptable risk, Contractor may request risk acceptance, supported by compensating controls, however only the State may formally accept risk. Failure to comply with this section will be deemed a material breach of the Contract.

7. Unauthorized Access. Contractor may not access, and must not permit any access to, State systems, in whole or in part, whether through the Hosted Services or otherwise, without the State's express prior written authorization. Such authorization may be revoked by the State in writing at any time in its sole discretion. Any access to State systems must be solely in accordance with the Contract and this Schedule, and in no case exceed the scope of the State's authorization pursuant to this Section. All State-authorized connectivity or attempted connectivity to State systems shall be only through the State's security gateways and firewalls and in compliance with the State's security policies set forth in the Contract as the same may be supplemented or amended by the State and provided to Contractor from time to time.

8. Security Audits.

8.1 During the Term, Contractor will maintain complete and accurate records of its data protection practices, IT security controls, and the security logs relating to State Data, including but not limited to any backup, disaster recovery or other policies, practices or procedures relating to the State Data and any other information relevant to its compliance with this Contract.

8.2 Without limiting any other audit rights of the State, the State has the right to review Contractor's data privacy and information security program prior to the commencement of Services and from time to time during the term of this Contract. The State, at its own expense, is entitled to perform, or to have performed, an on-site audit of Contractor's data privacy and information security program. If the State chooses to perform an on-site audit, Contractor will, make all such records, appropriate personnel and relevant materials available during normal business hours for inspection and audit by the State or an independent data security expert that is reasonably acceptable to Contractor, provided that the State: (i) gives Contractor at least five (5) Business Days prior notice of any such audit; (ii) undertakes such audit no more than once per calendar year, except for good cause shown; and (iii) conducts or causes to be conducted such audit in a manner designed to minimize

disruption of Contractor's normal business operations and that complies with the terms and conditions of all data confidentiality, ownership, privacy, security and restricted use provisions of the Contract. The State may, but is not obligated to, perform such security audits, which shall, at the State's option and request, include penetration and security tests, of any and all Hosted Services and their housing facilities and operating environments.

8.3 During the Term, Contractor will, when requested by the State, provide a copy of Contractor's and Hosting Provider's FedRAMP System Security Plan(s) or SOC 2 Type 2 report(s) to the State within two weeks of the State's request. The System Security Plan and SSAE audit reports will be recognized as Contractor's Confidential Information.

8.4 With respect to State Data, Contractor must implement any required safeguards as identified by the State or by any audit of Contractor's data privacy and information security program.

8.5 The State reserves the right, at its sole election, to immediately terminate this Contract or a Statement of Work without limitation and without liability if the State determines that Contractor fails or has failed to meet its obligations under this **Section 8.**

9. Application Scanning. During the Term, Contractor must, at its sole cost and expense, scan all Contractor provided applications, and must analyze, remediate and validate all vulnerabilities identified by the scans as required by the State Secure Web Application and other applicable PSPs.

Contractor's application scanning and remediation must include each of the following types of scans and activities:

9.1 Dynamic Application Security Testing (DAST) – Scanning interactive application for vulnerabilities, analysis, remediation, and validation (may include Interactive Application Security Testing (IAST).

(a) Contractor must either a) grant the State the right to dynamically scan a deployed version of the Software; or b) in lieu of the State performing the scan, Contractor must dynamically scan a deployed version of the Software using a State approved application scanning tool, and provide the State with a vulnerabilities assessment after Contractor has completed such scan. These scans and assessments i) must be completed and provided to the State quarterly (dates to be provided by the State) and for each major release; and ii) scans must be completed in a non-production environment with verifiable matching source code and supporting infrastructure configurations or the actual production environment.

9.2 Static Application Security Testing (SAST) - Scanning source code for vulnerabilities, analysis, remediation, and validation.

(a) For Contractor provided applications, Contractor, at its sole expense, must provide resources to complete static application source code scanning, including the analysis, remediation and validation of vulnerabilities identified by application source code scans. These scans must be completed for all source code initially, for all updated source code, and for all source code for each major release and Contractor must provide the State with a vulnerability assessment after Contractor has completed the required scans.

9.3 Software Composition Analysis (SCA) – Third Party and/or Open Source Scanning for vulnerabilities, analysis, remediation, and validation.

(a) For Software that includes third party and open source software, all included third party and open source software must be documented and the source supplier must be monitored by the Contractor for notification of identified vulnerabilities and remediation. SCA scans may be included as part of SAST and DAST scanning or employ the use of an SCA tool to meet the scanning requirements. These scans must be completed for all third party and open source software initially, for all updated third party and

open source software, and for all third party and open source software in each major release and Contractor must provide the State with a vulnerability assessment after Contractor has completed the required scans if not provided as part of SAST and/or DAST reporting.

9.4 In addition, application scanning and remediation may include the following types of scans and activities if required by regulatory or industry requirements, data classification or otherwise identified by the State.

(a) If provided as part of the solution, all native mobile application software must meet these scanning requirements including any interaction with an application programing interface (API).

(b) Penetration Testing – Simulated attack on the application and infrastructure to identify security weaknesses.

10. Infrastructure Scanning.

10.1 For Hosted Services, Contractor must ensure the infrastructure and applications are scanned using an approved scanning tool (Qualys, Tenable, or other PCI Approved Vulnerability Scanning Tool) at least monthly and provide the scan's assessments to the State in a format that is specified by the State and used to track the remediation. Contractor will ensure the remediation of issues identified in the scan according to the remediation time requirements documented in the State's PSPs.

11. Nonexclusive Remedy for Security Breach.

11.1 Any failure of the Services to meet the requirements of this Schedule with respect to the security of any State Data or other Confidential Information of the State, including any related backup, disaster recovery or other policies, practices or procedures, is a material breach of the Contract for which the State, at its option, may terminate the Contract immediately upon written notice to Contractor without any notice or cure period, and Contractor must promptly reimburse to the State any Fees prepaid by the State prorated to the date of such termination.

SCHEDULE G – Transition In and Out

The Contractor will be responsible for transitioning from MDOT's legacy system to the Contractor's new system. The Contractor will be required to coordinate efforts and schedules with the State's current ATMS system provider, the State, and any other State contractors. Following Award, Contractor shall develop a Deployment Transition Plan to identify the methodology, procedures, and steps required to transition the new ATMS system with minimal interruption in services. The Contractor must maintain the State's current equipment programming/configurations for each device as field changes will not be permitted. It is required that the successful Contractor coordinate closely with the State for development of this transition plan and during all stages of the transition. The plan must clearly identify the roles and responsibilities of all stakeholders, specifically noting any expectations of the State. The Contractor is responsible for submitting the Deployment Transition Plan for review by the State and adequately addressing comments prior to acceptance. The State shall accept the Deployment Transition Plan and schedule for system and software transition prior to the Contractor impacting the existing system.

Elements of the transition plan shall include the following, at a minimum:

1. The assignment of responsibilities and roles of personnel involved in the transition, including but not limited to the Contractor, State of Michigan (MDOT, DTMB), and State of Michigan Contractor(s).

2. Transition readiness assessment, including a risk matrix that identifies transition risks, assesses probability, and proposes mitigation or elimination strategies. Reasonable scenarios of transition problems will be presented, and proposed actions taken to allow transition to continue.

3. Procedures and milestone dates for the following activities:

    a. Installing all software components and data management systems

    b. Creating and configuring all ITS devices in the software

    c. Transition of software functionality and/or device integration. Note that the proposed phasing must maintain individual system functionality (e.g., the implementation of a managed corridor must be contained within a single phase)

    d. Completion of User Acceptance Testing (UAT)

    e. Completion of Authority to Operate (ATO)

    f. Setup and connection of all onsite hardware and/or cloud-based services and software

    g. Transfer of agreed upon data from existing systems

    h. Archival of agreed upon data from existing systems

    i. Training on new software functionality

    j. Decommissioning existing software and equipment

In addition, the Deployment Transition Plan shall be developed to comply with the following requirements:

1. The change-over shall be accomplished in phases, subject to the approval of the State.

    a. The State's preference is to minimize the time a single TOC must operate two systems; therefore, phasing shall consider TOC boundaries and cutting over all device types and systems within a TOC coverage area

b. The transition plan shall include a pilot phase within a single TOC coverage area, including a sample of all device types

c. The transition plan shall not include a phase that includes more than one TOC coverage area

d. The transition shall not result in a device down time of more than 30 minutes

e. The total transition period of a single TOC coverage area shall not exceed 7 calendar days

f. Once the first phase of transition begins, transition activity from the Contractor shall be continuous until transition is complete

2. The cut-over shall be accomplished during low-activity periods (8:00 p.m. to 5:00 a.m.)

   a. The Contractor shall coordinate with the State to identify any high priority devices that must be transitioned overnight and other devices/systems that may be staged

   b. Transition of complex operations (e.g., managed corridors) shall only occur between Friday (8 p.m.) and Monday (5 a.m.) unless agreed to by the State.

3. The cut-over shall not occur if it will affect TOC monitoring and management of an active traffic event. The State will approve commencement of transition within the hour ahead of the scheduled time

4. The Contractor shall identify the procedure to quickly restore operations of the existing systems if the cut-over is unsuccessful or if a high-impact incident arises during the transition period

5. The Contractor shall include anticipated transition dates within the project schedule and coordinate with the State when schedule adjustments are made. The Contractor shall provide a minimum of two week's notice to the State for approval prior to any system and software transition. The State reserves the right to disallow transition activities on specific dates (e.g., holidays, special events, staff availability).

In compliance with all the requirements, Contractor will provide all the required additional features, enhancements and updates to the existing ATMS system. Appropriate deployment procedures will be followed, based on past system upgrades with the state.

Contractor will develop a training and deployment transition plan (TDTP) that will correspond to the system operation, administration, and transition activities. In general, the TDTP will describe an extensive set of transition plan activities, including a step-by-step set of procedures that describe a logical phased cutover approach to the new ATMS, including any connections to relevant ancillary systems and supporting communications networks. The focus of TDTP will be maintaining operational uptime and minimizing any potential downtime. Contractor's transition experience will provide the State with a seamless cutover solution that will minimize operational disruptions. The TDTP will analyze the systems to transition, as well as the types and sources of data, interfaces, and communications.

The plan will align with the agreed-upon software releases and milestones, so ATMS data are available to support the software development, deployment, testing, and acceptance for each milestone. Techniques and tools for automating the data migration will be discussed in the TDTP so existing tools can be reused, and new tools created or leveraged as necessary. Contractor will structure TDTP work activities based on Agile development process, which includes implementation milestones where Contractor will customize/implement functionality within the iNET product as necessary to satisfy all State requirements. The milestones are defined to represent the completion of a software development sprint, which includes the following high- level tasks that lead to validation and integration:

- Roles and responsibilities will not change from previous system upgrades

- Review requirements for each customization/development sprint
- Customize/develop functional requirements as expected
- Validate in the Contractor development and client environments to ensure system readiness
- Any device or system integration is thoroughly tested prior to the move the state environment whenever possible
- If there is any risk with the deployment, contingency and role back options are addressed prior to deployment
- Multiple levels or testing are performed as applicable in accordance with the testing plan.
- Coordinate with client Operations and IT for access for integration
- Validate integration points with external systems/devices as available
- Appropriate documentation and test plans are provided to the state with each build
- If a build has an adverse effect on the system archiving and data retainage, Contractor works closely with the state to mitigate these issues prior to deployment.
- Training is provided as appropriate for the specific build. For more completed builds Contractor provides multiple levels of training included remote and in person training

The Project schedule currently shows two main builds to add the required requirements to the system. Contractor will be flexible with these dates, and add more interim builds, as required by the State. Contractor understand that builds must be coordinated closely with DTMB and other state activities.

Transition Out

If iNET ATMS is not retained at the completion of this project, Contractor will work closely with MDOT/DTMB and the incoming solution provider for a smooth transition. This will include the following:

- Throughout the transition period, Contractor will continue to provide support for the current iNET ATMS until it is taken offline.
- Contractor will assist with database queries, commands, or any technical issues related to iNET database, configurations, and data migration.
- Contractor will support the permanent migration of archived data to the new system. This would include access to the data, but not include any changes to the format of the data. This would be responsibility of the new provider.
- Contractor will coordinate with the incoming vendor to allow for the testing of MDOT devices and external interfaces, with the understanding that these devices and interfaces may need to be temporally taken off line in iNET and brough back on line after testing.
- If iNET needs to be restored temporarily due to unanticipated transition glitch, Contractor will provide direct or indirect support to expeditiously bring iNET online until the situation is resolved.
- At the end of the transition period, and upon transition approval, the new ATMS solution provider will assume full responsibility for all ATMS tasks and deliverables.

There will be no need for field changes to ITS devices/systems as a result of the transition to this contract.

SCHEDULE H - Federal Provisions Addendum

This addendum applies to purchases that will be paid for in whole or in part with funds obtained from the federal government. The provisions below are required and the language is not negotiable. If any provision below conflicts with the State's terms and conditions, including any attachments, schedules, or exhibits to the State's Contract, the provisions below take priority to the extent a provision is required by federal law; otherwise, the order of precedence set forth in the Contract applies. Hyperlinks are provided for convenience only; broken hyperlinks will not relieve Contractor from compliance with the law.

1. Equal Employment Opportunity

If this Contract is a "**federally assisted construction contract**" as defined in 41 CFR Part 60-1.3, and except as otherwise may be provided under 41 CFR Part 60, then during performance of this Contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.

(4) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided,* that if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

2. Davis-Bacon Act (Prevailing Wage)

If this Contract is a **prime construction contracts** in excess of $2,000, the Contractor (and its Subcontractors) must comply with the Davis-Bacon Act (40 USC 3141-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"), and during performance of this Contract the Contractor agrees as follows:

(1) All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable. The contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R. pt. 5 as applicable.

(2) Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.

(3) Additionally, contractors are required to pay wages not less than once a week.

3. Copeland "Anti-Kickback" Act

If this Contract is a contract for construction or repair work in excess of $2,000 where the Davis-Bacon Act applies, the Contractor must comply with the Copeland "Anti-Kickback" Act (40 USC 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in

Whole or in Part by Loans or Grants from the United States"), which prohibits the Contractor and subrecipients from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled, and during performance of this Contract the Contractor agrees as follows:

(1) Contractor. The Contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.

(2) Subcontracts. The Contractor or Subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA or the applicable federal awarding agency may by appropriate instructions require, and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

(3) Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a Contractor and Subcontractor as provided in 29 C.F.R. § 5.12.

4. Contract Work Hours and Safety Standards Act

If the Contract is **in excess of $100,000** and **involves the employment of mechanics or laborers**, the Contractor must comply with 40 USC 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5), as applicable, and during performance of this Contract the Contractor agrees as follows:

(1) Overtime requirements. No Contractor or Subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the Contractor and any Subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The State shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or Subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) Subcontracts. The Contractor or Subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

5. Rights to Inventions Made Under a Contract or Agreement

If the Contract is funded by a federal "funding agreement" as defined under 37 CFR §401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

6. Clean Air Act and the Federal Water Pollution Control Act

If this Contract is **in excess of $150,000,** the Contractor must comply with all applicable standards, orders, and regulations issued under the Clean Air Act (42 USC 7401-7671q) and the Federal Water Pollution Control Act (33 USC 1251-1387), and during performance of this Contract the Contractor agrees as follows:

Clean Air Act

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
2. The Contractor agrees to report each violation to the State and understands and agrees that the State will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency or the applicable federal awarding agency, and the appropriate Environmental Protection Agency Regional Office.
3. The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA or the applicable federal awarding agency.

Federal Water Pollution Control Act

(1) The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
(2) The Contractor agrees to report each violation to the State and understands and agrees that the State will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency or the applicable federal awarding agency, and the appropriate Environmental Protection Agency Regional Office.
(3) The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA or the applicable federal awarding agency.

7. Debarment and Suspension

A "contract award" (see 2 CFR 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (51 FR 6370; February 21, 1986) and 12689 (54 FR 34131; August 18, 1989), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(1) This Contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the Contractor is required to verify that none of the Contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

(2) The Contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any

lower tier covered transaction it enters into.

(3) This certification is a material representation of fact relied upon by the State. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the State, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

(4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

8. Byrd Anti-Lobbying Amendment

Contractors who apply or bid for an award of **$100,000 or more** shall file the required certification in Exhibit 1 – Byrd Anti-Lobbying Certification below. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

9. Procurement of Recovered Materials

Under 2 CFR 200.322, Contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act.

(1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired—

a. Competitively within a timeframe providing for compliance with the contract performance schedule;

b. Meeting contract performance requirements; or

c. At a reasonable price.

(2) Information about this requirement, along with the list of EPA- designated items, is available at EPA's Comprehensive Procurement Guidelines web site, https://www.epa.gov/smm/comprehensive- procurement-guideline-cpg-program.

(3) The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

10. Additional FEMA Contract Provisions.

The following provisions apply to purchases that will be paid for in whole or in part with funds obtained from the Federal Emergency Management Agency (FEMA):

(1) Access to Records. The following access to records requirements apply to this contract:

a. The Contractor agrees to provide the State, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

b. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
c. The Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.
d. In compliance with the Disaster Recovery Act of 2018, the State and the Contractor acknowledge and agree that no language in this contract is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.

(2) Changes.

See the provisions regarding modifications or change notice in the Contract Terms.

(3) DHS Seal, Logo, And Flags.

The Contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre-approval.

(4) Compliance with Federal Law, Regulations, and Executive Orders.

This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. The Contractor will comply with all applicable Federal law, regulations, executive orders, FEMA policies, procedures, and directives.

(5) No Obligation by Federal Government.

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the State, Contractor, or any other party pertaining to any matter resulting from the Contract."

(6) Program Fraud and False or Fraudulent Statements or Related Acts.

The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

Schedule H, Attachment 1 - Byrd Anti-Lobbying Certification

Contractor must complete this certification if the purchase will be paid for in whole or in part with funds obtained from the federal government and the purchase is greater than $100,000.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor, Parsons Transportation Group Inc. of Michigan certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Contractor’s Authorized Official

Joseph Brahm, PE – Vice President

Name and Title of Contractor’s Authorized Official

July 29, 2022

Date

SCHEDULE I – ACCEPTANCE TESTING

The parties agree as follows:

1. **Definitions.** For purposes of this Schedule, the following terms have the meanings set forth below. All initial capitalized terms in this Schedule that are not defined in this **Section 1** of Schedule I have the respective meanings given to them in the Contract's Software Terms and Conditions.

"Acceptance" has the meaning set forth in **Section 3.6** of this Schedule I, "Accept" and "Accepted" have a correlative meaning. [1:25 PM] Hude, Daniel (AG)

"Acceptance Testing" means the act of performing or conducting Acceptance Tests. Also called "User Acceptance Testing" or "UAT"

"Acceptance Tests" means such tests as may be conducted in accordance with **Section 3** of this Schedule and the Statement of Work to determine whether the Software meets the Requirements.

"**Acceptance Test Plan**" means the Contractor's written plan outlining the schedule, acceptance and integration tests to be conducted, the purpose of each test, the environment in which the test will be conducted, the passing criteria, procedures for logging Non-Conformities and tracking corrections and re-testing status also called "Acceptance Testing Plan" or "User Acceptance Testing Plan" or "UAT Plan."

"Integration Testing" means UAT performed on configured, customized, or modified Software as a whole to ensure full operability, integration, and compatibility among all elements of the Solution.

"Non-Conformity" or **"Non-Conformities"** means any failure or failures of the Software to conform to the Requirements, and any applicable specifications set forth in the Documentation.

"SUITE" means the State Unified Information Technology Environment, which was designed and implemented to standardize methodologies, processes, procedures, training, and tools for project management and systems development lifecycle management.

"Test Data" means the Contractor's or the State's test data and testing scripts for use during Acceptance Testing.

"Test Environment" means the operating environment for purposes of UAT.

"Testing Period" has the meaning set forth in **Section 3** of this Schedule.

"Test Results" means the pass/fail results that the Contractor or the State observed by processing the Test Data using the Software compared to what actually happened.

2. **Parties Obligations for Acceptance Testing**.

2.1 Contractor Acceptance Testing Obligations. The Contractor will complete the following tasks as part of UAT:

A. Install, configure, and deploy the Software into the Test and Production Environments;

B. Create and provide to the State, sufficient Test Data to adequately test the Software, including testing of any hardware for purposes of Integration Testing;

C. Review any State-created Test Data and provide necessary feedback to the State;

D. Assist the State with completing any necessary SUITE documentation;

E. Communicate to the State that the Testing Environment is ready for use prior to initiation of Acceptance Tests.

F. Create written Acceptance Test Plans (ATP) in accordance with **Section 3**.

G. Conduct pre-test using the approved ATP plans. Document pre-test results and submit to the State to show successful completion.

H. Train State staff on how to perform Acceptance Tests using the ATP Plans.

I. Correct Non-Conformities in Test Results in accordance with **Section 3** of this Schedule, which are identified by the Contractor or the State during the Testing Period;

J. Conduct status meetings during Acceptance Testing to assess Test Data and Test Results;

K. Provide a tracking system for Contractor and the State to log Non-Conformities and track corrections and re-testing status;

L. Deliver the Software with response plans pre-programmed and templates populated;

M. Integrate all State devices, systems, Managed Corridors, and other components to allow Final Acceptance Tests (FAT) to be performed in accordance with Section 3.2; and

N. The Contractor is solely responsible for all costs and expenses related to the Contractor's performance of, participation in, and observation of Acceptance Testing.

2.2 State Assistance with Acceptance Testing: The State agrees to assist with the following tasks as necessary:

A. Develop and provide additional tests for the ATP;

B. Execute tests and report Test Results to the Contractor in accordance with the ATP Plans;

C. Participate in testing status meetings;

D. Enter Non-Conformities into the Contractor-provided issue tracking system. Details to be entered include a minimum of: (i) detailed description of the problem (include screenshot(s) if applicable); and (ii) steps needed to reproduce the issue;

E. Perform regular retest of Contractor resolved Non-Conformities based on mutually agreed schedule; and

F Work with the Contractor to prioritize issues that arise during Acceptance Testing.

G. Witness Acceptance Tests conducted by the Contractor.

3. Acceptance Testing; Acceptance.

The Contractor shall develop written Acceptance Test Plans (ATP) to validate that the hardware, software, interfaces, and other functionality meets each requirement identified in Schedule A – Statement of Work and Schedule A – Table 1, Business Specification Worksheet. The ATPs must be submitted to the State for review a minimum of thirty (30) calendar days prior to the scheduled testing start date. Testing may not commence until the ATPs are accepted by the State. The Contractor will be responsible for addressing all comments received and resubmitting to the State for acceptance. If a resubmittal is deemed to not adequately address all comments, multiple resubmittals may be required before the ATPs are accepted by the State.

A phased acceptance testing process may be used to align with a phased implementation approach if agreed to by the State. Unless otherwise specified in the Statement of Work, upon installation of the Software, Acceptance Tests will be conducted as set forth in this Section 3 to ensure the Software conforms to the requirements of this Contract, including the applicable Specifications and Documentation. Acceptance Tests will be conducted by the party responsible as set forth in the Statement of Work or, if the Statement of Work does not specify, the State, provided that:

(i) for Acceptance Tests conducted by the State, if requested by the State, the Contractor will make suitable for Contractor Personnel to be available to observe or participate in such Acceptance Tests; and

(ii) for Acceptance Tests conducted by the Contractor, the State has the right to observe or participate in all or any part of such Acceptance Tests.

The ATPs will serve as guides to operationally test system hardware, field-to-center communications, software, and integrations as identified in Schedule A – Statement of Work and Schedule A – Table 1, Business Specification Worksheet. The ATPs must include a detailed description of the tests to be conducted, the purpose of each test, the steps to conduct each test, the environment the test will be conducted, and the passing criteria.

The State may suspend Acceptance Tests and the corresponding Testing Period by written notice to the Contractor if the State discovers a material Non-Conformity in the tested Software or part or feature of the Software. In such event, the Contractor will immediately, and in any case within ten (10) Business Days, correct such Non-Conformity, whereupon the Acceptance Tests and Testing Period will resume for the balance of the Testing Period.

The State may suspend Acceptance Tests and the corresponding Testing Period at their discretion as deemed necessary if unforeseen circumstances arise.

The Contractor must coordinate with the State to agree upon any date and/or time restrictions associated with Acceptance Tests involving active devices.

The State reserves the right to defer any Acceptance Test to a future project phase.

The following ATPs shall be developed:

3.1 Software User Acceptance Testing (UAT). Upon completion of approved project tasks and the State's approval of ATP, a start date shall be set for Software UAT which shall be conducted diligently for up to sixty (60) Calendar Days, or such other period as may be set forth in the Statement of Work (the "Testing Period"). The State may, but is not obligated, to perform its own pretest on the Software utilizing the Contractor's UAT Plan. If the State does perform a pretest, and the Contractor's UAT Plan does not successfully pass as described by the Contractor's UAT Plan, the State, at its discretion, is not obligated to move into the formal Acceptance Tests set forth in this Section 3. The State may elect to require the Contractor to correct any problems encountered during the pretest.

Software UAT shall include the following test plans:

A. **Device Confirmation Test plan** – to test each combination of device, make, model, firmware version, and communication configuration to show compatibility with the ATMS software. Device confirmation testing will require the integration of each combination using the State's active devices. The Device Confirmation Test must be conducted by the Contractor and witnessed by the State. The Contractor must coordinate with the State to identify which devices will be included in this test. These devices will be disconnected from the State's existing ATMS and connected to the State's Testing Environment with the Contractor's ATMS for testing. Following the Contractor's

device confirmation tests, the devices may remain in the testing environment for up to 30 calendar days to allow the State to conduct additional testing. These devices may be reconnected to the State's existing ATMS at the State's discretion.

B. **Integration Test plan** – Integration Testing will take place to verify integration functionality upon delivery and installation of any application programming interface (API), database connection, third-party integration, configuration or customization to the Software under the Statement of Work.

C. **Software Acceptance Test plan** – to verify complete system functionality in accordance with each requirement in Schedule A – Statement of Work and Schedule A – Table 1, Business Specification Worksheet between the State and the Contractor. The Software Acceptance Test must be conducted by the State with assistance from the Contractor. The Contractor's Software Acceptance Test plan must identify which tests will be conducted using virtual devices, mock-up devices, and/or active State devices and if the test will be conducted using simulated and/or real data.

3.2 Final Acceptance Testing (FAT). FAT shall be performed in the Production Environment to verify the full functionality of all components of the software with the full integration of all devices and data feed integrations. The Contractor shall work with the State to install and configure their ATMS in the State's Production Environment. The FAT may occur in phases in accordance with the accepted Transition Plan. All FAT results must be documented by the Contractor and submitted to the State for review and acceptance after each testing phase.

A. **Final Device Test plan** – performed at a SOM workstation or TOC following the integration of each device into the new ATMS to confirm the seamless integration and full functionality as defined in the business requirements.

B. **Final System Test plan** – performed at a SOM workstation or TOC following the integration of each system (all devices within a subject system must pass Final Device Test prior to Final System Test) to confirm the seamless integration and full functionality as defined in the business requirements.

C. **Final Integration Test plan** – performed at a SOM workstation or TOC following the integration of each data feed integration to confirm the seamless integration and full functionality as defined in the business requirements.

D. **Burn-in Test –** Burn-In starts following the successful completion of final device, system, and integration testing, as described in this Section. The State will have sixty (60) Business Days to use the Software in the Operating (Production) Environment to confirm the systems overall functionality. There may be no major failures during the burn-in period. If one occurs, the sixty (60) Business Day period will be restarted after the major failure has been corrected to the State's satisfaction. The following criteria constitute a major failure:

(i) Any failure that requires more than 48 hours to correct after providing notice to the Contractor.

(ii) Frequent occurrence of minor failures indicating a major system flaw, as determined by the State.

A minor failure is any other failure that adversely effects the accomplishment of an operational function. The sixty (60) Business Day burn-in period must be stopped when a minor failure occurs and restarted without resetting to zero after the minor failure is corrected to the satisfaction of the State.

3.3 Notices of Completion, Non-conformities, and Acceptance. Within fifteen (15) Business Days following the completion of any Acceptance Tests, including any Integration Testing, the party responsible for conducting the tests will prepare and provide to the other party written notice of the completion of the tests. Such notice must include a report describing in reasonable detail the tests conducted and the results of such tests, including any uncorrected Non-Conformity in the tested Software.

A. If such notice is provided by either party and identifies any Non-conformities, the parties' rights, remedies, and obligations will be as set forth in **Section 3.4** and **Section 3.5**.

B. If such notice is provided by the State, is signed by the State Program Managers or their designees, and identifies no Non-Conformities, such notice constitutes the State's Acceptance of such Software.

C. If such notice is provided by the Contractor and identifies no Non-Conformities, the State will have sixty (60) Business Days to use the Software in the Operating Environment and determine, in the exercise of its sole discretion, whether it is satisfied that the Software contains no Non-Conformities, on the completion of which the State will, as appropriate:

(i) Notify the Contractor in writing of Non-Conformities the State has observed in the Software and of the State's non-acceptance thereof, whereupon the parties' rights, remedies and obligations will be as set forth in **Section 3.4** and **Section 3.5**; or

(ii) Provide the Contractor with a written notice of its Acceptance of such Software, which must be signed by the State Program Managers or their designees.

3.4 Failure of Acceptance Tests. If Acceptance Tests identify any Non-Conformities, the Contractor, at the Contractor's sole cost and expense, will remedy all such Non-Conformities and re-deliver the Software, in accordance with the requirements set forth in the Statement of Work. Redelivery will occur as promptly as commercially possible and, in any case, within thirty (30) Business Days following, as applicable, the Contractor's:

A. Completion of such Acceptance Tests, in the case of Acceptance Tests conducted by the Contractor; or

B. Receipt of the State's notice under **Section 3.4(A)** or **Section 3.3(C)(i)**, identifying any Non-Conformities.

The State reserves the right to conditionally accept identified Non-Conformities as follows:

A. A Non-Conformity pending resolution which must be resolved within the next two software releases or within six months, whichever occurs first; or

B. A Non-Conformity resolved through the provision of a workaround that is deemed satisfactory, in the State's sole discretion.

3.5 Repeated Failure of Acceptance Tests. If Acceptance Tests identify any Non-Conformity in the Software after a second or subsequent delivery of the Software, or the Contractor fails to re-deliver the Software on a timely basis, the State may, in its sole discretion, by written notice to the Contractor:

A. Continue the process set forth in this **Section 3**;

B. Accept the Software as a nonconforming deliverable, in which case the Fees for such Software will be reduced equitably to reflect the value of the Software as received relative to the value of the Software had it conformed; or

C. The State reserves the right to conditionally accept identified repeat Non-Conformities as follows:

i. A Non-Conformity pending resolution which must be resolved within the next two software releases or within six months, whichever occurs first; or

ii. A Non-Conformity resolved through the provision of a workaround that is deemed satisfactory, in the State's sole discretion.

D. Deem the failure to be a non-curable material breach of this Contract and the Statement of Work and terminate this Contract for cause in accordance with **Section 16.1 of the Contract's Software Terms and Conditions**.

3.6 Acceptance. Acceptance ("**Acceptance**" or "**Final Acceptance**") of the Software will occur upon the successful completion of the Burn In Test and the State's delivery of a notice accepting the Software under **Section 3.3B or 3.3C(ii)**.