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 **4**
to
Contract Number **MA200000000971**

CONTRACTOR	
	1SPATIAL, INC.
	8614 Westwood Center Dr. Suite 450
	Vienna VA 22182
	Sheila Steffenson
	210-863-4948
	Sheila.Steffenson@1spatial.com
	CV0136125

STATE			
	Program Manager	Mark Holmes	DTMB
		517-241-6469	
		Holmesm3@Michigan.gov	
	Contract Administrator	Jeremy Lyon	DTMB
		517-230-2858	
		lyonj5@michigan.gov	

CONTRACT SUMMARY			
Geospatial Integration Software and Services			
INITIAL EFFECTIVE DATE	**INITIAL EXPIRATION DATE**	**INITIAL AVAILABLE OPTIONS**	**EXPIRATION DATE BEFORE**
June 10, 2020	June 10, 2025	5 - 12 Months	June 10, 2025
PAYMENT TERMS		**DELIVERY TIMEFRAME**	
N/A		Net 45	
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**
☒	24 Months	☐		June 10, 2027
CURRENT VALUE	**VALUE OF CHANGE NOTICE**	**ESTIMATED AGGREGATE CONTRACT VALUE**		
$3,407,950.00	$225,000.00	$3,632,950.00		

DESCRIPTION

8/14/2024, this change is to utilize two option years and add funding for $225,000 while we continue leveraging the 1Spatial contract, including the annual maintenance renewals.

STATE OF MICHIGAN
CENTRAL PROCUREMENT SERVICES
Department of Technology, Management, and Budget
320 S. WALNUT ST., LANSING, MICHIGAN 48933
P.O. BOX 30026 LANSING, MICHIGAN 48909

CONTRACT CHANGE NOTICE

Change Notice Number **3**

to

Contract Number **200000000971**

CONTRACTOR	
	1SPATIAL, INC.
	8614 Westwood Center Dr. Suite 450
	Vienna, VA 22182
	Sheila Steffenson
	210-863-4948
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	CV0136125

STATE			
	Program Manager	Mark Holmes	DTMB
		517-241-6469	
		Holmesm3@Michigan.gov	
	Contract Administrator	Sean Regan	DTMB
		(517) 284-6993	
		regans@michigan.gov	

CONTRACT SUMMARY			
GEOSPATIAL INTEGRATION SOFTWARE AND SERVICES			
INITIAL EFFECTIVE DATE	**INITIAL EXPIRATION DATE**	**INITIAL AVAILABLE OPTIONS**	**EXPIRATION DATE BEFORE**
June 10, 2020	June 10, 2025	5 - 1 Year	June 10, 2025
PAYMENT TERMS		**DELIVERY TIMEFRAME**	
ALTERNATE PAYMENT OPTIONS			**EXTENDED PURCHASING**
☐ P-Card	☐ PRC	☐ Other	☒ Yes ☐ No
MINIMUM DELIVERY REQUIREMENTS			

DESCRIPTION OF CHANGE NOTICE				
OPTION	**LENGTH OF OPTION**	**EXTENSION**	**LENGTH OF EXTENSION**	**REVISED EXP. DATE**
☐		☐		June 10, 2025
CURRENT VALUE	**VALUE OF CHANGE NOTICE**	**ESTIMATED AGGREGATE CONTRACT VALUE**		
$2,900,000.00	$507,950.00	$3,407,950.00		

DESCRIPTION

Effective 7/19/22, this change notice will reflect the addition of the next phase of the project which is to implement Workflow and Notification functionality to improve the integration of GIS data aggregations. This change will be in the amount of $507,950.00. Please see attached SOW for further review.

All other terms, conditions, specifications, and pricing remain the same. Per contractor and agency agreement, DTMB Central Procurement Services approval, and State Administrative Board approval on 7/19/2022.

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June 27, 2022

Mark Holmes
Geospatial Services Manager
State of Michigan – DTMB - Center for Shared Solutions
Romney Building, 10th Floor, 111 S. Capitol Ave. Lansing, MI 48933

Executive Summary

1Spatial has worked with Michigan's Department of Technology, Management, and Budget's (MTDB) Center for Shared Solutions (CSS) to implement and optimize 1Integrate Enterprise for the Michigan Geographic Framework (MGF). This effort greatly improved the stability of the rules engine and provided improved performance of 1Integrate For ArcGIS.

MGF provides a central repository of spatial data for Michigan state, regional, and local agencies. CSS also provides a submission and workflow platform to update MGF. The platform consists of Esri and 1Spatial technology highlighted in Table 1.

Table 1:Software Components of MGF Submission Workflow

Software	Description
Esri's ArcGIS Server and Portal for ArcGIS	Provides the submission portal and permissions (this is being replaced by 1Data Gateway)
Esri's Workflow Manager (extension of ArcGIS Server)	Provides an interface to build and process jobs
1Spatial's 1Integrate	Provides the rules engine to validate and process submissions

CSS has experienced reliability issues with Esri's Workflow Manager. These issues include the following:

- large submissions timing out
- active workflows timing out
- workflow steps failing

Additionally, Esri's Workflow Manager restricted the number of submissions to the number of CPU Cores. In production this means only 8 submissions can be running at any given time. The 9th and subsequent submissions are rejected. CSS has expressed the desire to replace Esri's Workflow Manager with a technology better fitting the requirements of the MGF system.

As part of this change order, 1Spatial proposes to replace Esri's Workflow Manager with Camunda's Enterprise Workflow Platform and supporting products. Camunda's Enterprise Workflow Platform uses industry standard definitions and supports large companies across many industries including banking, mobile, transportation, and entertainment. Camunda provides the ability to have multiple jobs processing through one or multiple workflows with minimal resources which should reduce the hardware and license footprint of the current system. A Camunda instance with 2 CPU and 8-16 GB Memory would be able to start 100 jobs/second where the current architecture is limited to starting a single job for each available CPU. Additionally, the connection between Camunda and 1Integrate will use product libraries rather than python scripts reducing the maintenance with future software releases.

Additionally, the change order includes other enhancements to MGF that have been identified by CSS to include updating the NG911 workflow to support data roll up into the MGF system and additional rule development to enhance the MGF workflow in supporting MDOT roads submissions.

1Spatial Summary

1Spatial is a software solutions provider and global leader in managing geospatial data. We work with our clients to deliver real value by making data current, complete and consistent through the use of automated processes - ensuring that decisions are always based on the highest quality information available.

Our unique, rules-based approach delivers enterprise-scale, cross-platform, automation to all stages of the data lifecycle. It builds confidence in the data while reducing the time and cost of stewardship.

Our global clients include utility and telecommunications businesses, national mapping and land management agencies, government departments, emergency services, defense, census bureaus and transportation organizations.

As a leader in our field, we have a wealth of experience and a record of continual innovation and development. We partner with some of the leading technology vendors including Esri, Oracle, and SAP. For more information visit www.1spatial.com.

1Integrate Summary

1Spatial's 1Integrate Commercial off the Shelf (COTS) products stand apart from all other data QA/QC packages for several reasons. The 1Spatial COTS rules engine is unique in its flexibility and configurability to handle a variety of data challenges such as undershoots, overshoots, gaps, overlaps, attribution errors, alignment issues, etc. Our rules-based, automated engine goes beyond just locating errors as it also allows for "action" rules that can automate repairs to the data.

Traditionally, 1Integrate has been used in the following scenarios:

- Validation – rules define how the data should exist. The engine identifies any feature that does not conform to the standard.
- Correction – rules define how data should be changed to conform to the standard.
- Integration – rules define how data sets should be combined to meet the standard including:
    - Change detection – identifying how multiple datasets depict the same location. Changes can be identified between different providers, multiple vintages of the same provider, or multiple vintages from different providers.
    - Data Integration – apply changes identified during change detection to update one or more datasets.
    - Data Fusion – combining multiple siloed datasets to create a new dataset with information unavailable in an individual silo.
    - Schema Transformation – applying rules to transform between schema definitions and identifying what the source does not provide but is needed by the target.

Additionally, 1Integrate utilizes our proprietary object-oriented cache which was developed to handle both large volumes of data as well as complex data processing tasks. The object-oriented nature of the cache provides for scalable performance even when the complexity of the rules or actions increases. 1Integrate leverages the object-orientated cache to provide the flexibility to work with a variety of schemas and file types, making 1Integrate client agnostic.

Camunda Summary

Camunda Process Automation software enables some of the most competitive organizations around the world to orchestrate and automate complex processes in a new way. A way that helps them overcome technology, organization, and infrastructure roadblocks, so they can lay the foundation for a new digital enterprise and follow the vision of automating any process, anywhere.

Workflow Enterprise Platform Summary

Camunda's Enterprise Workflow Platform executes processes that are defined in Business Process Model and Notation (BPMN), the global standard for process modeling. With BPMN, you can automate your most complex business processes using an easy-to-adopt visual modeling language.

Processes are complex and include many different steps, components, and endpoints across different technologies. The Workflow Engine orchestrates processes that span APIs, microservices, business

decisions and rules, human work, IoT devices, RPA bots, and more, so you have complete control and visibility for your most critical business processes.

Workflow Enterprise Workflow Platform consists of

- Workflow Engine – provides process orchestration
- Cockpit – provides a real-time view of processes
- Tasklist – provides interface for manual step progression
- Modeler – provides an interface to author workflows which can be promoted to the Workflow Engine

Project Methodology

1Spatial implements projects using a combination of the IBM Rational Unified Process (RUP) and Agile concepts. RUP consists of 4 phases (Inception, Elaboration, Construction, and Transition).

1. Inception begins with a project kick off and the establishment of project management
2. Elaboration focuses on building out the environment and high-level project design
3. Construction consists of rule and test case authoring
4. Transition focuses on provision of documentation and any remaining project components to the customer

Following Agile processes, weekly sprint meetings will be held with the customer to review:

1. Work completed (may include demonstrations)
2. Issues encountered
3. Plans for the next set of priorities

These weekly meetings may be extended to a bi-weekly basis after the first two weekly meetings if deemed appropriate by all involved.

1Spatial will also conduct daily internal standups with the rule implementation team. The daily standups will focus on similar topics on a smaller scale and members of MI DTMB maybe be invited if their input is required.

The following activities & deliverables have been identified for this project:

Project Activities

Inception

1Spatial will work with the CSS IT Support team to ensure the server architecture (Attachment 2 – System Design) is updated to support Camunda in the development environment. As shown in the architecture diagram in the System Design Document, Camunda will leverage the existing architecture for the MGF environment. 1Spatial will also confirm remote access (RDP) to the workflow server.

1Spatial will install the Camunda Enterprise Platform software on the workflow server in CSS's development environment. 1Spatial will configure Camunda to authenticate via LDAP. This includes configuring Camunda to use CSS's SQL Server for storing the metadata for workflow definitions and progress. 1Spatial will provide CSS with the required software specifications including

- SQL Server database size and permissions.
- Java 11

During the installation, 1Spatial will create an Install Guide for Camunda specific to the CSS environment. This document will be used to configure the UAT/QA and Production environments by CSS.

CSS will setup the environment to provide (in the Michigan hosted Development environment)

1. Esri Feature Services for the MGF Prod database
2. SQL Server Spatial database with the MGF Prod schema

1Spatial will perform performance tests from 1Integrate reading and writing to both options. 1Spatial will then provide those metrics to CSS to determine if the Prod database will be Esri Enterprise Geodatabase (SDE) or SQL Server Spatial. Based on the selection, 1Spatial will configure 1Integrate MGF Data Stores to use the desired target. If Esri Enterprise Geodatabase (SDE) is selected, 1Spatial will use ArcGIS Server 10.9.1. The implementation of Camunda as well as the testing of the Camunda workflow will test the datastores for the selected target.

1Spatial will upgrade 1Integrate and 1Data Gateway to the most recent versions in the development environment. 1Spatial will configure the capability for 911 contributors to load Exceptions in 1Data Gateway and 1Integrate after upgrade.

Elaboration

After the workflow server has Camunda installed in CSS's development environment, 1Spatial will start configuring Camunda for supporting the MGF system. Camunda provides the capability to view workflows and jobs currently running in those workflows and see how many jobs are at each step in the workflow. The licensing provided in the Billing table allows for up to 25 users to monitor jobs. This is intended to provide the CSS team the ability to review jobs.

Configure Camunda to send emails

The current workflow system provides email alerts to CSS staff as well as external users. Camunda has an optional plugin for Workflow Engine to provide this same functionality. 1Spatial will enable the optional plugin and work with the CSS staff to configure the plugin to connect to the CSS mail (SMTP) server. During the construction phase, 1Spatial will add tasks to send emails using the configured plugin.

Review requirements for 911 integration into MGF

The current implementation has focused on updating the MGF data directly from contributors. A second project using 1Data Gateway and 1Integrate allowed providers to contribute their 911 data into a separate data repository just for emergency services. During this project 1Spatial will work with CSS to add another workflow that pushes 911 contribution data into MGF after updating the emergency services data repository, if desired. During elaboration 1Spatial will gather the requirements for the workflow and design the Camunda workflow definition as well as the rule updates for handling data from the 911 contributors.

Construction

1Spatial will perform the following consulting actions during the project:

Configure 1Integrate to trigger a workflow in Camunda

In the current implementation, 1Spatial has created a component to call the existing workflow software to create and start a job (an individual running instance of a workflow). 1Spatial will update this component to call Workflow Engine to create and start a job.

Build 1Integrate Camunda library

1Spatial, for the earlier phases, created a Python library to communicate with the 1Integrate REST API. This library focused on creating and running jobs (sessions). With the move to Camunda, 1Spatial will transition this library to Java for integration with Camunda. This move will provide tighter integration between Camunda and 1Integrate in the MGF environment. This library will have the ability to

- Clone Sessions and Data Stores
- Create Data Stores
- Run Sessions
- Retrieve the status of Sessions
- Delete Sessions and Data Stores

The library will be incorporated into the core 1Integrate product, reducing the effort to maintain and update the system with each new 1Integrate release.

Build MGF Camunda library

In addition to the 1Integrate Python library, 1Spatial built an MGF library in Python using the ArcPy library to handle workflow specific components like

- Creating the necessary transition tables for a job
- Defining the Data Stores and Sessions
- Tracking the job performance

Each workflow uses staging tables to pass data between workflow tasks. These tables are currently stored in Esri's Enterprise Geodatabase. To create and delete the tables, the workflow uses python scripts with ArcPy. Esri's ArcGIS technology uses an entire server cpu core per each ArcPy instance running.

The current process contains unnecessary overhead, server specification and licensing that can be significantly reduced if these stagging tables are moved from SDE into SQL Server's native spatial tables (SQL Server Spatial). To further improve the architecture, 1Spatial will update the tasks to create tables to use SQL Server Spatial from Camunda. CSS already has the capability to read and write data from SQL Server Spatial. 1Spatial will update the data store templates which read and write the staging tables to use SQL Server Spatial.

1Spatial will migrate the MGF Python library to integrate with Camunda and the 1Integrate Camunda library. Camunda Workflow engine will call out to the MGF Camunda to perform the necessary steps to create SQL tables and 1Integrate sessions for the current job.

Configure Contributor Workflows in Camunda's Workflow Engine

The existing MGF system uses two workflow definitions. All contributors, aside from MDOT, use the General Contributor workflow. MDOT which submits road, trail, and railroad updates has a separate workflow to allow for tighter collaboration between CSS and MDOT.

Configure General Contributor Workflow

Most contributors work fully disjoint from CSS. These contributors submit their data on an irregular schedule. The General Contributor Workflow definition in Camunda's Workflow Engine will follow the existing Esri Workflow Manager definition shown in Appendix A. 1Spatial will build the definition through the use of Camunda's Modeler.

Configure MDOT Contributor Workflow

MDOT and CSS work closely together to create statewide products. The MDOT contributor workflow takes advantage of the state agency to state agency relationship and extends the General Contributor workflow providing MDOT, as a contributor, the opportunity to review the changes proposed to the MGF system.

1Spatial will transfer the tasks currently in the Esri Workflow Manager MDOT definition (Appendix B) through Camunda's Modeler into the workflow definition.

Configure 911 Contributor Workflow in Camunda's Workflow Engine

CSS provides a second data submission partnership, also leveraging 1Data Gateway, for 911 contributions. Two 911 layers, Road and Address, are represented in MGF as well as 911 and currently the two submissions are not linked. This section takes the next step to allow 911 submissions to flow directly into the 911 contribution and MGF contribution workflows automatically. There are two options, the first leverages the 911 Vintage over Vintage change detection to pass the delta features through to MGF, skipping the Contributor Load and Contributor Validate as those were completed during the 911 workflow. The second option passes the entire road file to the MGF as a regular contributor and will run the MGF Contributor Load and Validate steps.

Option 1 Pass 911 Submission to MGF Step 3

As part of another project, 1Spatial configured 1Data Gateway and 1Integrate to accept data (Roads, Addresses, PSAPs) for the Michigan emergency services data repository. The data submitted for the 911 portal (1Data Gateway) also needs to be brought into the MGF repository. This task is to configure a workflow that takes the updates from the emergency services data repository and pushes those same updates to the MGF Repository. This will allow data providers to submit data to one program while supporting multiple programs.

Some contributors who were willing to share with the emergency services data repository will not be willing to contribute to MGF. 1Spatial will build a SQL Server lookup table, which will be maintained by CSS through their partnership agreements with contributors, to define which contributions will be merged into MGF. Only contributions from contributors identified in the lookup table will execute the workflow merging the updates into MGF.

The existing business rules for non MDOT contributions assume a full road network or address layer. The emergency services contribution workflow performs a Vintage over Vintage (VoV) Change Detection and application process. The VoV works on the assumption of a single provider (for a given layer and location), but the MGF workflow will have multiple contributors, including MDOT, for the road layer. 1Spatial will configure new business rules to take the delta created during the 911 VoV. The new business rules will use the results (Proposals) from the emergency service workflow and compare them to identify the changes required for the MGF data (specifically Road and Address)

Option 2 Pass 911 submission to MGF Step 1

1Spatial will update the existing 911 1Integrate sessions to call Camunda to create and start a workflow instance automatically at the end of the submission. In this second option the entire dataset provided by the contributor will be passed into the Road or Address workflow.

Additional Improvements to the Business Rules

Through the initial phases of the project additional requirements were identified but tabled for post-production release enhancements. 1Spatial will implement the two improvements identified below.

- Removing Redundant Nodes – identify intersections where only two roads met. If the two roads have the exact same key attribute values, then the roads should be merged into a single road.
- Event Submission – Expand the existing MDOT workflows to handle updating the Event data. In the current implementation, the MDOT Events are handled manually as they are only updated once each year. MDOT is working to streamline their processes to keep Events more in sync with the linear network.

Transition

1Spatial will perform initial testing of the system in Michigan's Development Environment. Test will include submitting MDOT Roads and Ultra Priority boundaries layers through the workflow. To test the 911 workflows, 1Spatial will submit sample Road and Address data from 3 counties. This will test the MDOT, General Contributor and 911 Workflows.

During the test 1Spatial will ensure the following steps complete as expected.

- Submitting via 1Data Gateway
- Ensure the Camunda workflow start
- Ensuring emails alerts are sent properly
- Watching the Camunda trigger 1Integrate session for Change Detection
- Ensuring users can manually trigger the workflow to move to Update
- Watching Camunda received the 'complete' notice from Update and starting MGF Validate
- Ensuring the Camunda workflow pauses if Errors are identified in MGF Validate
- Ensuring the contribution (timing and conformance) metrics are populated

1Spatial will simulate a network outage by

1. shutting down the 1Integrate machine to ensure that the updated libraries fail and pause the job in Camunda Workflow Engine.
2. restarting the 1Integrate machine and attempting to restart the job from the failed step (restarting this step from the beginning).

1Spatial will finalize the documentation on

- viewing workflows in progress
- advancing workflows through the interface

Delivery

All artifacts created during the construction phase will be turned over MI DTMB.

On-going Project Activities

1. Project Management
    a. Throughout the project, 1Spatial will provide project management to ensure on time deliveries and raise concerns quickly. 1Spatial uses a combination of the Rational Unified Process and AGILE project management to create and maintain a plan for delivery.
    b. During this project we suggest using weekly status reporting to ensure that the team (both 1Spatial and MI DTMB members) are in constant contact and do not duplicate efforts. 1Spatial plans for meetings to demonstrate progress at times and dates convenient to MI DTMB
2. Test Case Documentation
    a. 1Spatial will document the test cases in two ways.
        i. Populate the Description field visible on the Rule Authoring Interface
        ii. Create test cases with input scenarios and expected output.
    b. The tests cases will be provided as an Esri File GeoDatabase for future user.

Risks

1. Lack of access to Michigan's infrastructure – to mitigate we need to complete on boarding during the inception. Invitations will be extended to all relevant parties to attend inception meetings. This will include any Mi DTMB staff who will be responsible for the security and maintenance of Mi DTMB's IT infrastructure.

Pre-requisites

1. Example data to be provided by MI DTMB prior to the beginning of work.
2. Remote Desktop access to be provided by MI DTMB before the Elaboration phase

Assumptions

1. 1Spatial will train MI DTMB staff for using Camunda in relation to the MGF Workflows configured during the project
    a. View in progress jobs
    b. Advance or pause existing jobs
    c. Cancel jobs

2. Availability of MI DTMB Staff to regularly utilize 1Integrate and Camunda to become adept in maintaining the system
3. CSS will perform all the updates to the architecture across environments
4. CSS will perform all the installations in UAT and Production environments
5. CSS will provide access to 1Spatial to install Camunda on the development server
6. 1Spatial will install Camunda in development environment
7. 1Spatial will provide support to install Camunda in UAT and Production environments
8. CSS will create the required Esri Feature Services and manage the ArcGIS Server software and configuration (if Esri Feature Services is chosen)

Test Strategy

User acceptance testing will be performed by MI DTMB using rules and scripts provided by 1Spatial during the delivery phase. Support as part of MI DTMB current support arrangement will be provided, however additional rule creation and updates to the solution will be considered out of scope. These may be handled by an agreement for additional work detailed by a future SOW.

MI DTMB has 3 weeks to test the General Contributor and MDOT workflows. The 911 workflow is a new workflow and MI DTMB is expected to complete testing of the Workflow 3 weeks after delivery of all components (business rules and workflow definition)

Project Timeline and Billing

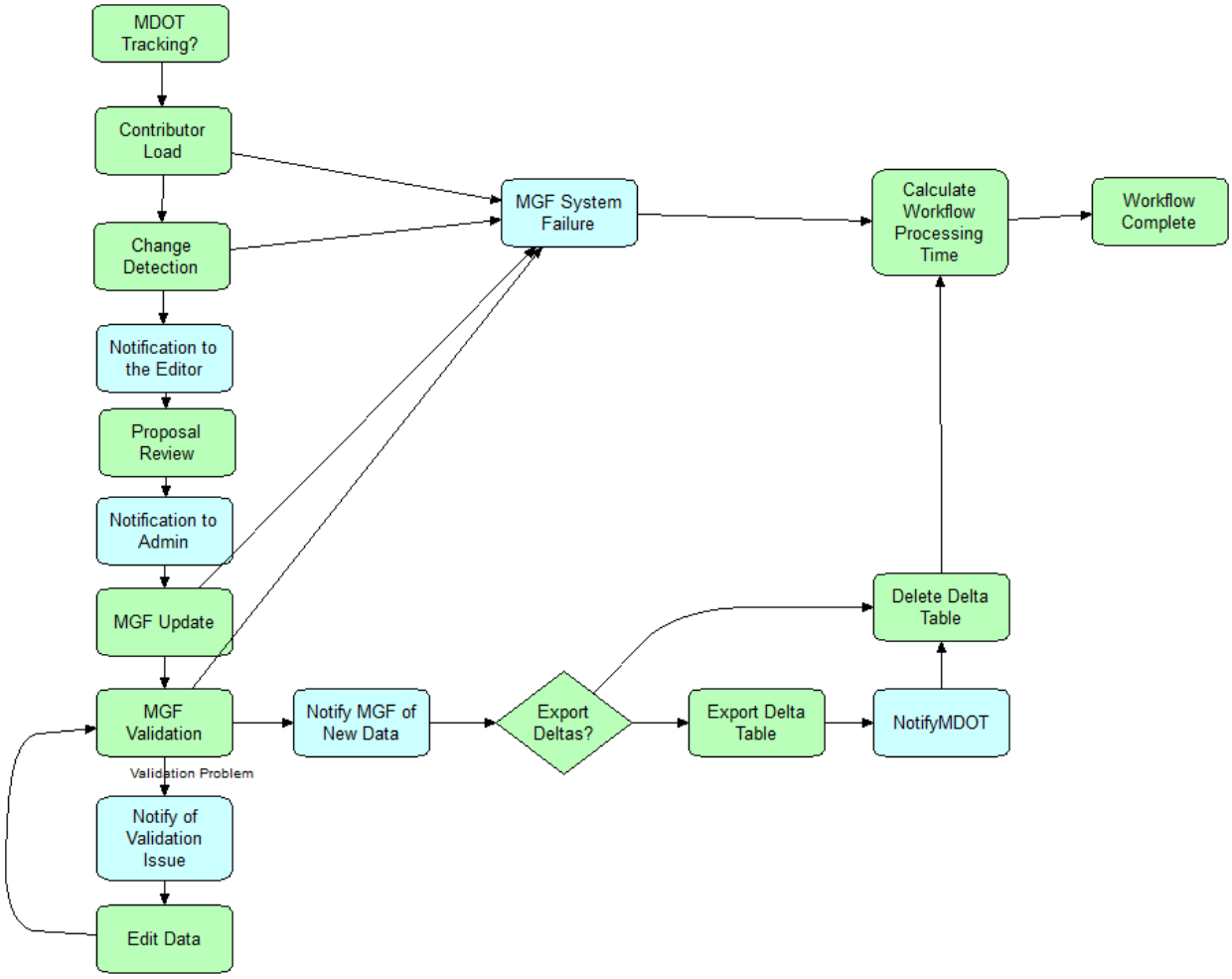
Task	Description	Estimate Delivery	Price
Camunda Installation	Architecture Design, Installation, Configuration, Documentation	2 weeks (after Award)	$30,800
Evaluate Esri Enterprise vs SQL Server Spatial	Perform read and write load test against potential targets. Provide comparison results to CSS for final decision	3 weeks	$10,000
Camunda Software*See Attachment 3)	Software Licensing • 5,000 jobs/year	2 weeks	$53,625

	• 25 task users		
MGF Camunda Library	Library ensuring existing contribution metrics are populated	8 weeks	$59,000
MGF General Contributor Workflow	Migrate the general workflow from Esri WMX to Camunda	4 weeks	$57,000
MGF MDOT Workflow Delivery	Migrate the MDOT from Esri WMX to Camunda	8 weeks	$61,000
MGF Camunda Library and Workflows Acceptance	CSS Acceptance of the migrated workflows	11 weeks	$90,000
Subtotal			$361,425
911 Workflow Delivery	Create a new workflow in Camunda for 911	12 weeks	$49,375
911 Workflow Acceptance	CSS Acceptance of the new workflow	15 weeks	$49,375
Subtotal			$98,750
Business Rule Improvements	Additional business rules to maintain the MGF database	4 weeks	$51,400
Total:			**$507,950**

Attachment 1 – General Contributor Workflow

This is the workflow used by all but one contributor (MDOT shown below). The Workflow Software (Esri's Workflow Manager - WMX) stores information about each job in a database table. The database consists of 3 key tables

- **Contributor** – a table of potential contributors
- **ContributorLayer** – a table mapping contributors to layers they can submit
- **Contribution** – a table of jobs submitted. This contains all the metadata for a job. The current status, step, timing information (actually a referenced table), number of features, path to the disk, path to 1Integrate Schema Mapping.



MDOT Tracking

Michigan Department of Transportation (MDOT) is interested in specific layers. This step reads a table in a database, hosted in MDOT's environment, to determine if the data submitted has a (MGF) target layer that MDOT wants to review. The decision becomes a flag on the Job record and used during the 'Export Deltas' decision point

Contributor Load

WMX calls Python script that returns success (0) or failure (1). This portion of the Python script 1) creates the resources needed by the rest of the workflow and 2) transfers the contributor data from the Upload EGDB to the Staging EGDB.

The resources created for this step are those that are needed by 1Integrate to perform the job. All feature classes needed for this job are created during this step. This includes the Staging feature class, the Proposal feature class, and the Report feature classes. All 1Integrate data stores needed for this job are created during this step. All tables are created with a JOB<ID>_.

The script calls 1Integrate to

1. copy a session template to process the job
2. run the session
3. get the session status
4. pull down timings (when complete)

These steps are repeated for each 1Integrate step

The session (specified in the WMX Job table) transfers the submitted data into the Staging EGDB.

NOTE: Schema mapping and data validation is done via 1DataGateway.

Change Detection

WMX calls Python script that returns success (0) or failure (1).

The session compares data submitted (loaded from staging EGDB) against the MGF target layer (production EGDB). Proposals are created for identified changes. Changes have a type and status which are used in the review step

Proposal Review

This is a manual step. Once Change Detection completes an email notification is sent to specific people. Users review the proposals inside ArcMap/ArcGIS Pro connecting to the staging EGDB.

When complete the user (or a admin user) needs to manually complete the step in WMX. When marked as done, WMX automatically will start the next step.

MGF Update

WMX calls Python script that returns success (0) or failure (1).

The session applies changes to the MGF target layer (production EGDB).

MGF Validation

WMX calls Python script that returns success (0) or failure (1).

The session validates the production EGDB performing cross validations with the target layer and companion layers. I.e. a road is contained within a boundary. Issues are written to spatially enabled reports.

Edit Data

This is a manual step. If MGF Validation identifies issues, this step is started. Users can review spatially enable reports of the issues and correct the MGF data. Once the data is corrected Validation is run until 0 Errors exist (there are multiple levels of report Error, Warning, Information).

Export Tables

When MDOT Tracking is enabled, the proposals are copied from the staging EGDB into the MDOT EGDB for review and investigation.

Delete Tables

Staging tables for a specific job are deleted.

Calculate Workflow Processing Times

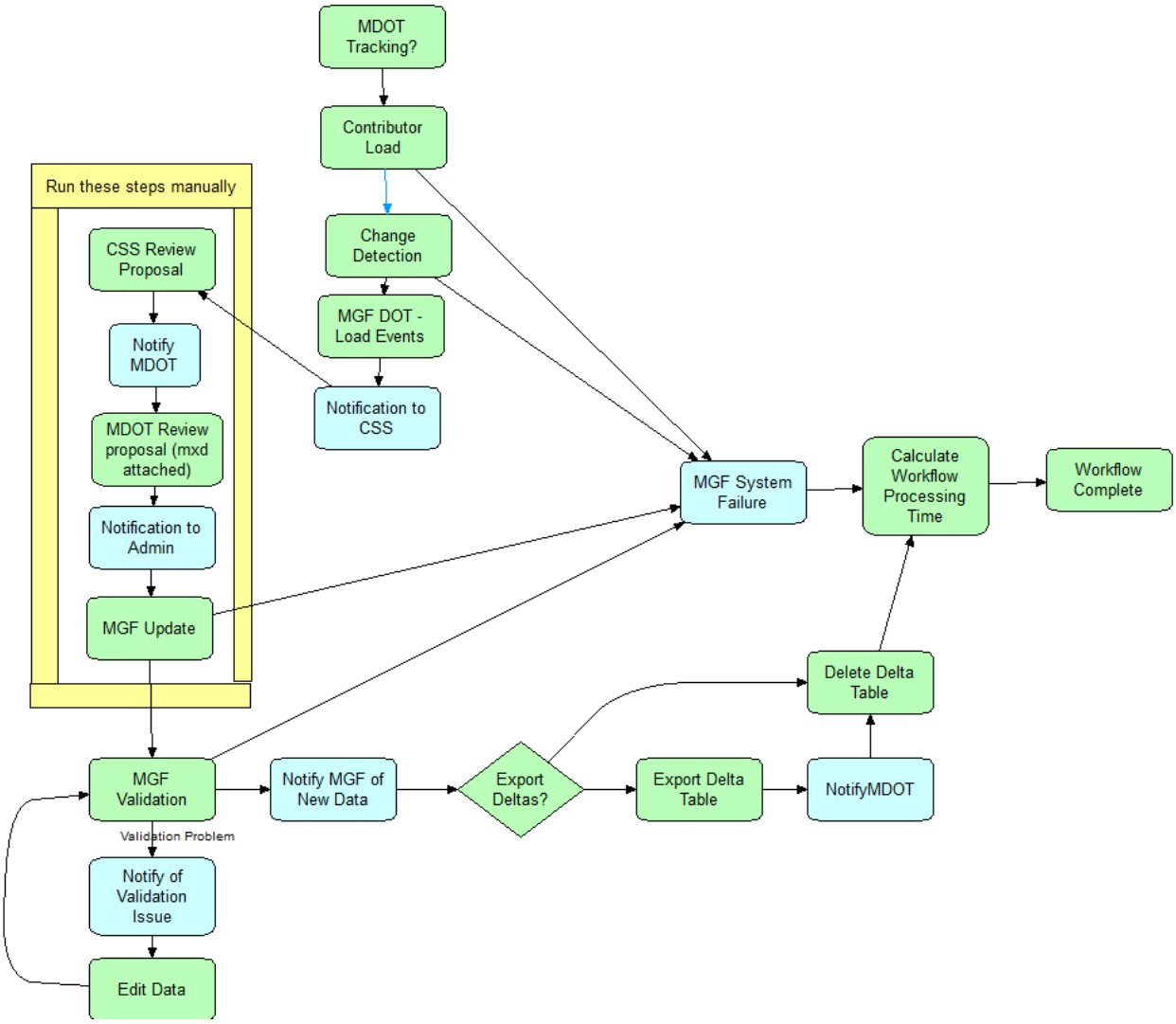
Calculate Processing Times and metadata which is used inside the dashboard (or will be used inside a dashboard)

Workflow Complete (Terminal Status)

MGF System Failure (Terminal Status)

Appendix B - MDOT Workflow

The MDOT workflow follows many of the same steps as above. The addition here is that Proposal Review is done with the MDOT team.



Attachment 2 – System Design Document

The 1Spatial/State of Michigan Camunda Architecture diagram (found below) illustrates a high-level overview of incorporating the software Camunda into the current State of Michigan infrastructure.

The diagram depicts three distinct environments – Development, User Acceptance Testing, and Production. Each environment has a three-tier approach which aligns with what the State of Michigan has provided.

Within each environment 1Spatial has provided recommendations on which software and functionality to add and or remove. Those are as follows:

DEV:

- Remove ESRI Workflow Manager (WMX) from ArcGIS Server
- Install Camunda on ArcGIS Server
    - Any additional third-party libraries needed for functionality with Camunda
- Add an additional VIP to the F5 for 1Integrate. Create DNS “1Integratedev.state.mi.us”
- Create an SSL Certificate for 1Integrate VIP

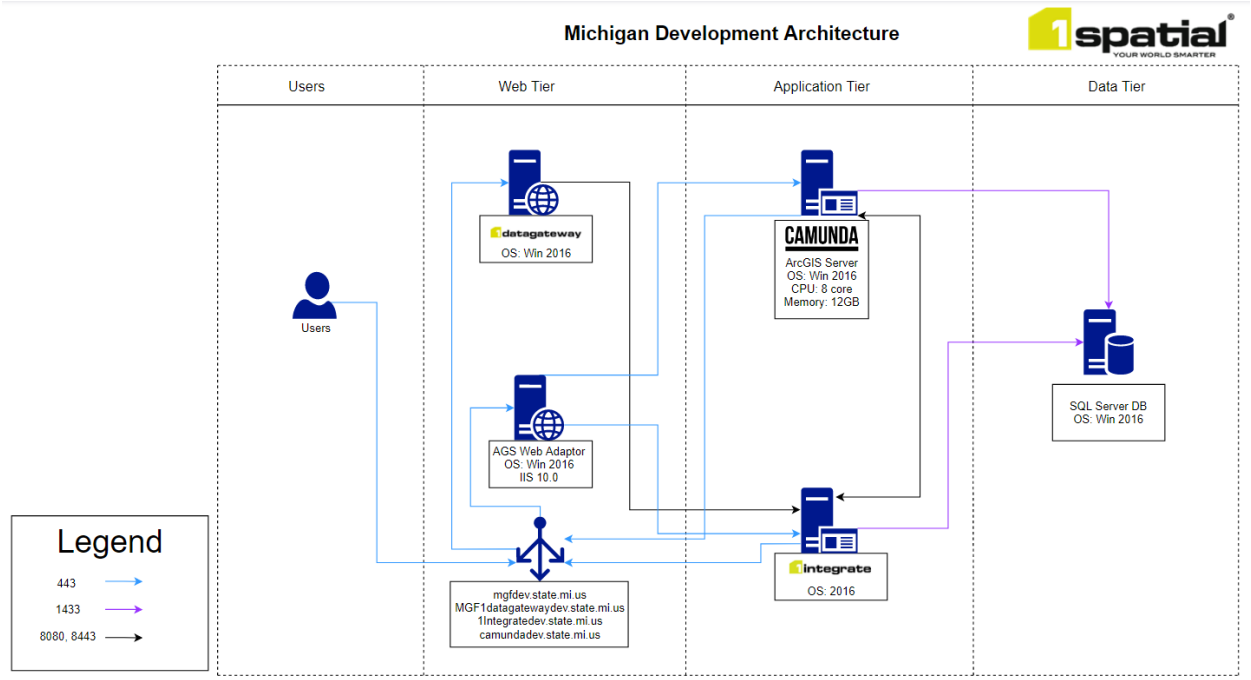
UAT:

- Remove ESRI Workflow Manager (WMX) from Private ArcGIS Server
- Install Camunda on ArcGIS Server
    - Any additional third-party libraries needed for functionality with Camunda
- Add an additional VIP to the F5 for 1Integrate. Create DNS “1Integrateqa.state.mi.us”
- Create an SSL Certificate for 1Integrate VIP

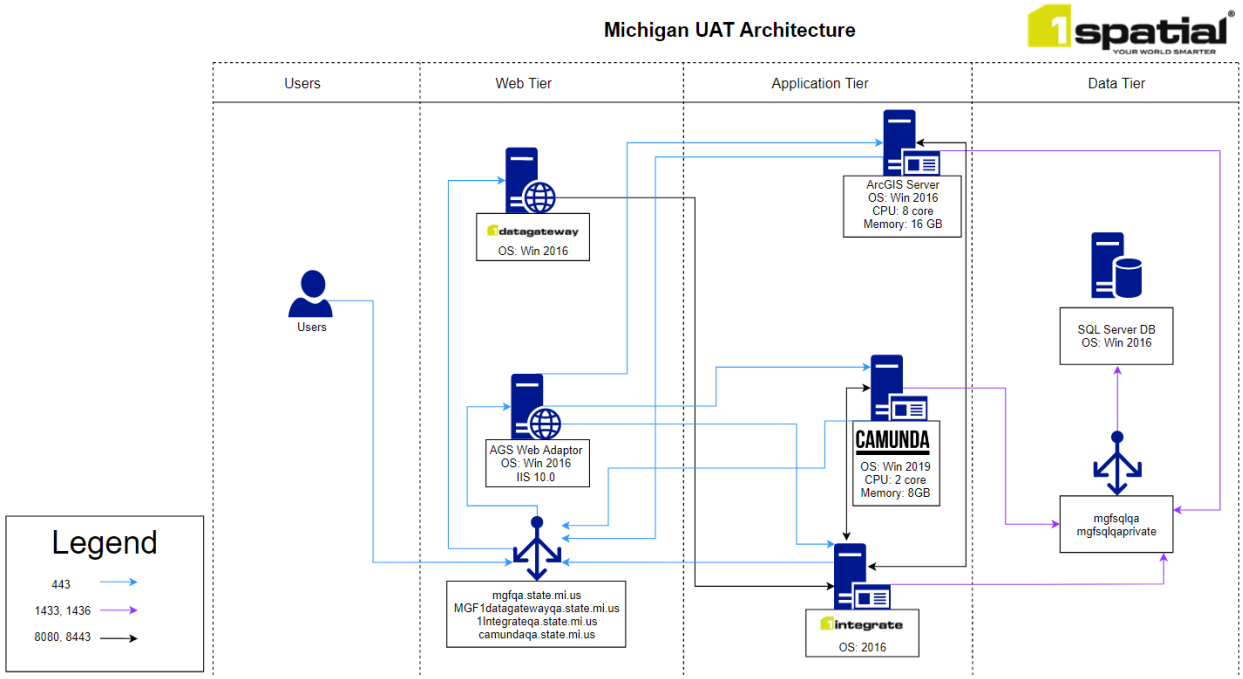
PROD:

- Remove ESRI Workflow Manager (WMX) from both Private ArcGIS Servers
- Install Camunda on both Private ArcGIS Server for High Availability (HA)
    - Any additional third-party libraries needed for functionality with Camunda
- Add an additional VIP to the F5 for 1Integrate. Create DNS “1Integrate.state.mi.us”
- Create an SSL Certificate for 1Integrate VIP

DEV Diagram


Michigan Development Architecture
1spatial
YOUR WORLD SMARTER
Users
Web Tier
Application Tier
Data Tier
Users
datagateway
OS: Win 2016
CAMUNDA
ArcGIS Server
OS: Win 2016
CPU: 8 core
Memory: 12GB
SQL Server DB
OS: Win 2016
AGS Web Adaptor
OS: Win 2016
IIS 10.0
integrate
OS: 2016
mgfdev.state.mi.us
MGF1datagatewaydev.state.mi.us
1Integratedev.state.mi.us
camundadev.state.mi.us
Legend
443
1433
8080, 8443

UAT Diagram


Michigan UAT Architecture
1spatial
YOUR WORLD SMARTER
Users
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datagateway
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OS: Win 2016
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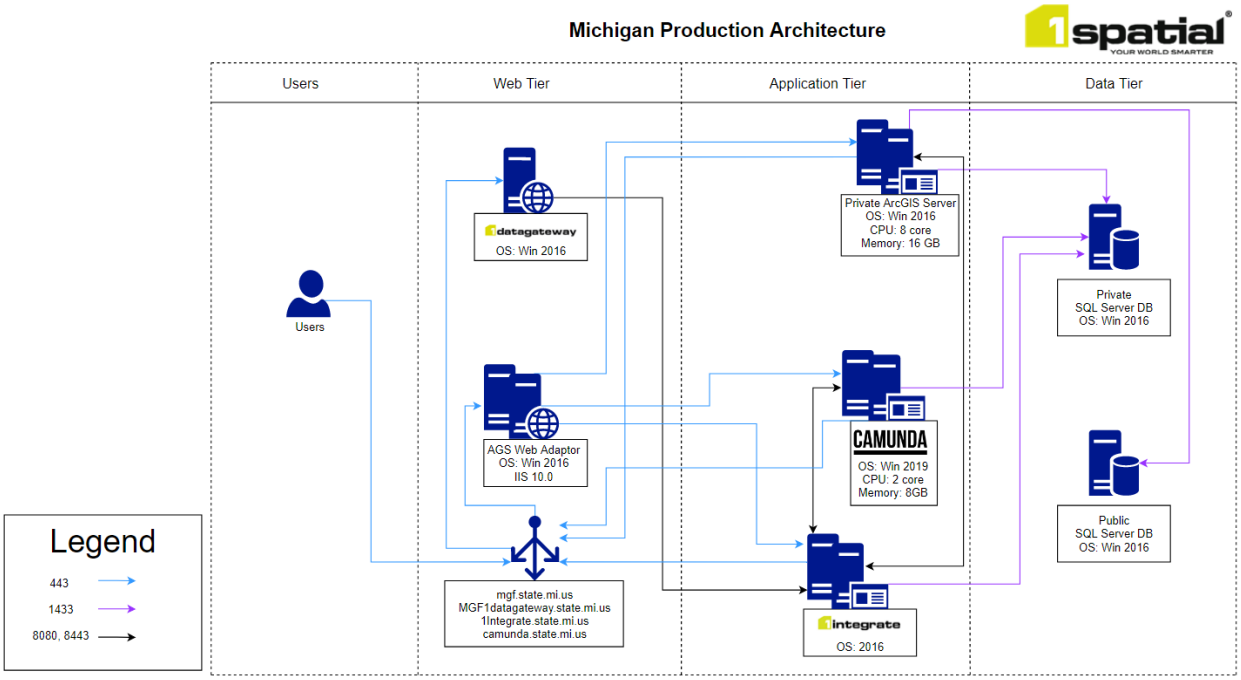
OS: Win 2016
AGS Web Adaptor
OS: Win 2016
IIS 10.0
CAMUNDA
OS: Win 2019
CPU: 2 core
Memory: 8GB
mgfsqlqa
mgfsqlqaprivate
mgfqa.state.mi.us
MGF1datagatewayqa.state.mi.us
1Integrateqa.state.mi.us
camundaqa.state.mi.us
integrate
OS: 2016
Legend
443
1433, 1436
8080, 8443

PROD Diagram



Attachment 3 - Camunda Platform Pricing - USD

Process Instances

Tier	**P-XS**	**P-S**	**P-M**	**P-L**	**P-XL**	**P-XXL**
max. Process Instances per year	5.000	35.000	245.000	1.700.000	12.000.000	85.000.000
Price	**$49,500**	**$69,300**	**$97,020**	**$134,640**	**$190,080**	**$269,280**
Maximum volume discount	10%	12%	15%	20%	25%	30%
Decision Instances						
Tier	**D-XS**	**D-S**	**D-M**	**D-L**	**D-XL**	**D-XXL**
max. Decision Instances per year	50.000	350.000	2.450.000	17.150.000	120.050.000	840.350.000
Price	**$27,500**	**$38,500**	**$53,900**	**$75,460**	**$105,644**	**$147,902**
Maximum volume discount	10%	12%	15%	20%	25%	30%
Task Users						
Tier	**T-XS**	**T-S**	**T-M**	**T-L**	**T-XL**	**T-XXL**
max. Task Users per year	25	100	300	600	1.000	2.500
Price	**$4,125**	**$14,850**	**$39,600**	**$64,350**	**$82,500**	**$144,375**
Maximum volume discount	10%	12%	15%	20%	25%	30%

Upgrade Options	**Price**
Advanced SLA	20% markup on the tier total price
Additional Named Contact per Year	$6,600
Remote Consulting per hour	$290

STATE OF MICHIGAN
CENTRAL PROCUREMENT SERVICES
Department of Technology, Management, and Budget
320 S. WALNUT ST., LANSING, MICHIGAN 48933
P.O. BOX 30026 LANSING, MICHIGAN 48909

CONTRACT CHANGE NOTICE

Change Notice Number **2**

to

Contract Number **200000000971**

CONTRACTOR	
	1SPATIAL, INC.
	8614 Westwood Center Dr. Suite 450
	Vienna, VA 22182
	Sheila Steffenson
	210-863-4948
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	CV0136125

STATE			
	Program Manager	Mark Holmes	DTMB
		517-241-6469	
		Holmesm3@Michigan.gov	
	Contract Administrator	Sean Regan	DTMB
		(517) 284-6993	
		regans@michigan.gov	

CONTRACT SUMMARY

GEOSPATIAL INTEGRATION SOFTWARE AND SERVICES

INITIAL EFFECTIVE DATE	INITIAL EXPIRATION DATE	INITIAL AVAILABLE OPTIONS	EXPIRATION DATE BEFORE
June 10, 2020	June 10, 2025	5 - 1 Year	June 10, 2025

PAYMENT TERMS	DELIVERY TIMEFRAME

ALTERNATE PAYMENT OPTIONS	EXTENDED PURCHASING
☐ P-Card ☐ PRC ☐ Other	☒ Yes ☐ No

MINIMUM DELIVERY REQUIREMENTS

DESCRIPTION OF CHANGE NOTICE

OPTION	LENGTH OF OPTION	EXTENSION	LENGTH OF EXTENSION	REVISED EXP. DATE
☐		☐		N/A

CURRENT VALUE	VALUE OF CHANGE NOTICE	ESTIMATED AGGREGATE CONTRACT VALUE
$2,900,000.00	$0.00	$2,900,000.00

DESCRIPTION

Effective 5/31/2022, the following amendment is hereby incorporated into the Contract to develop workflows to merge in the new 2020 Census block, blockgroups, tracts and new legislative districts to match the MGF municipal civil divisions and counties. Total estimated cost is $76,500. No additional funding is needed at this time; existing funds are adequate to support this change.

All other terms, conditions, specifications, and pricing remain the same. Per contractor, agency and DTMB procurement.

8614 Westwood Center Dr., Suite 450

Vienna, VA 22182-2278 USA

Phone: 703-444-9488

Fax: 703-444-4922

May 3, 2022

Mark Holmes

Michigan Center for Shared Solutions

Executive Summary

1Spatial is pleased to submit this proposed Statement of Work (SOW) to Michigan in response to the request to assist Michigan with the implementation of an automated workflow to perform alignment of the US Census Block feature to the Michigan legal boundaries and Roads. The State of Michigan has indicated that their legal boundaries and roads no longer align to the US Census Block features that were generated after the 2020 census. 1Spatial has found that this is a common occurrence with many organizations and has built automated business rules within 1Integrate to assist in the realignment, either to the US Census or aligning to the US Census data. For the State of Michigan, we are proposing re-aligning the Block Groups to the Michigan Boundaries. As part of the re-alignment, 1Spatial will do a pre-cursory set of validation checks to identify existing issues with the US Census data and/or the State of Michigan data. 1Spatial will then configure their existing rulesets to perform the data alignment with a goal of automating the alignment of 95% of the block groups. The remaining 5% will be for the State to determine how they would like to proceed with the cleanup effort.

1Spatial Summary

1Spatial is a software solutions provider and global leader in managing geospatial data. We work with our clients to deliver real value by making data current, complete and consistent through the use of automated processes - ensuring that decisions are always based on the highest quality information available.

Our unique, rules-based approach delivers enterprise-scale, cross-platform, automation to all stages of the data lifecycle. It builds confidence in the data while reducing the time and cost of stewardship.

Our global clients include utility and telecommunications businesses, national mapping and land management agencies, government departments, emergency services, defense, census bureaus and transportation organizations.

As a leader in our field, we have a wealth of experience and a record of continual innovation and development. We partner with some of the leading technology vendors including Esri, Oracle, and SAP.

1Integrate Summary

1Spatial's 1Integrate Commercial off the Shelf (COTS) products stand apart from all other data QA/QC packages for several reasons. The 1Spatial COTS rules engine is unique in its flexibility and configurability to handle a variety of data challenges such as undershoots, overshoots, gaps, overlaps, attribution errors, alignment issues, etc. Our rules-based, automated engine goes beyond just locating errors as it also allows for "action" rules that can automate repairs to the data.

Traditionally, 1Integrate has been used in the following scenarios:

- Validation – rules define how the data should exist. The engine identifies any feature that does not conform to the standard.
- Correction – rules define how data should be changed to conform to the standard.
- Integration – rules define how data sets should be combined to meet the standard including:
    - Change detection – identifying how multiple datasets depict the same location. Changes can be identified between different providers, multiple vintages of the same provider, or multiple vintages from different providers.
    - Data Integration – apply changes identified during change detection to update one or more datasets.
    - Data Fusion – combining multiple siloed datasets to create a new dataset with information unavailable in an individual silo.
    - Schema Transformation – applying rules to transform between schema definitions and identifying what the source does not provide but is needed by the target.

Additionally, 1Integrate utilizes our proprietary object-oriented cache which was developed to handle both large volumes of data as well as complex data processing tasks. The object-oriented nature of the cache provides for scalable performance even when the complexity of the rules or actions increases. 1Integrate leverages the object-orientated cache to provide the flexibility to work with a variety of schemas and file types, making 1Integrate client agnostic.

For these reasons, we are unique in the market and are unaware of any other packages that have all these capabilities without the requirement of custom development by a software engineer.

Project Methodology

1Spatial implements projects using a combination of the IBM Rational Unified Process (RUP) and Agile concepts. RUP consists of 4 phases (Inception, Elaboration, Construction, and Transition).

1. Inception begins with a project kick off and the establishment of project management
2. Elaboration focuses on building out the environment and high-level project design

3. Construction consists of rule and test case authoring
4. Transition focuses on provision of documentation and any remaining project components to the customer

Following Agile processes, weekly sprint meetings will be held with the customer to review:

1. Work completed (may include demonstrations)
2. Issues encountered
3. Plans for the next set of priorities

These weekly meetings may be extended to a bi-weekly basis after the first two weekly meetings if deemed appropriate by all involved.

1Spatial will also conduct daily internal standups with the rule implementation team. The daily standups will focus on similar topics on a smaller scale and members of Michigan maybe be invited if their input is required.

The following activities & deliverables have been identified for this project:

Project Activities

Inception

Prior to the project kickoff, 1Spatial will perform an initial data assessment of both the MGF datasets and the US Census block which will set a baseline for the percent automation goals.

For the initial data assessment, 1Spatial will first validate the datasets in MGF (County, Township, City, Village, and Road), to ensure there are not existing alignment issues within the State of Michigan MGF database. These alignment issues will cause issues with the automated alignment of US Census to MGF and will either need to be corrected prior to alignment or ignored during the alignment process.

1Spatial will also validate the US Census block dataset to determine if there are any alignment issues within their block dataset. While US Census tends to have topologically accurate datasets, there could be alignment issues introduced during pre-processing tasks performed by the State of Michigan, for example, projecting the data into Michigan GeoRef. These alignment issues will cause issues with the automated alignment of US Census to MGF and will either need to be corrected prior to alignment or ignored during the alignment process.

1Spatial will then validate where US Census Block do not align to MGF datasets listed above. Each location of an alignment issue will be tallied and will be used, where US Census Block to the MGF does not have any preexisting issues, to ensure a 95% automation metric to be achieved at the end of the project.

Once the assessment is completed 1Spatial will host a project kickoff to review the

- Schedule
- Total number of alignment issues
- Baseline number of alignment issues
- Review the automation goals

Elaboration

1Spatial will present the strategy used to perform Census Boundary alignment for previous customers (e.g. LA Department of Public Works). The strategy includes the following capabilities in 1Integrate

- Topological snapping (for small [i.e., centimeter tolerance] differences)
- Cut and Merge (transfer portions of a Census Block to another Census Block)
- Buffering - Positive and Negative (identify islands along shoreline)

1Spatial will hold 2 workshops (1 to 2 hours each) with Michigan to discuss scenarios so that Michigan can better understand the strategies. The outcome of these workshops will be a suite of test cases, with expected results. Each Test case will include:

- Inputs schema
- Expected Outputs (Markups, Proposals, Updated features)

The test cases will be used to determine if the rule is behaving as desired and used during regression testing for future software or rule updates. The test cases will be approved during the second workshop, prior to beginning Rule Authoring. The approved test cases define the acceptance criteria. Test cases will include scenarios with the layers MGF mentioned in Inception

Construction

1Spatial will author rules to align the US Census Block to the Road layer. 1Spatial will apply these alignment rules against Road layer in addition to polygon layers.

1Spatial will apply the alignment strategies to determine the order and combination that provides the best results to the test cases and the full state. 1Spatial anticipates applying the strategies three times to achieve the 95% percent alignment. 1Spatial will document the strategies and order that provided the best results as well as strategies reviewed but not chosen as an appendix in the Usage Guide.

Optional Component

1Spatial will author rules to build the hierarchal legislative boundaries from the Census Blocks. These include the following

- Census Block Group
- Census Tract

- US House (US Congress)
- State House
- State Senate

Michigan will provide the required lookup tables to map Census Blocks (or the lower-level feature) to the other legislative boundaries. Any delay in providing these layers will adversely affect the delivery timeline and could incur additional costs.

Transition

1Spatial will configure a single project inside Michigan's Development instance of 1Data Gateway. This will provide Michigan a simple workflow to perform Census Block alignment and legislative boundary creation for future use. 1Spatial will confirm the 1Data Gateway project by testing the ability to load 1 Esri File Geodatabases (FGDB) for the US Census Block, MGF layers pulled from the SDE connection, and download a single FGDB containing the

1. Corrected US Census Block features
2. Markups identifying the remaining US Census Block features needing manual correction

Created 1DataGateway instance will output fully aligned Census Block data as an exported FGDB feature class. This export FGDB can then be used as the submission to the MGF Workflow for the US Census Block layer in the future.

Delivery

All artifacts created during the construction phase will be turned over the State of Michigan. This will include:

1. Completed Initial Assessment + Kickoff
    a. Markup Layer showing the initial issues
2. Boundary Alignment Rules
    a. Alignment Ruleset
    b. Markup Template FGDB
    c. Test Case FGDB
3. Aligned dataset FGDB
    a. Updated Census Blocks
    b. Generated Legislative boundaries
    c. Markups where manual update is required
4. 1Data Gateway project

Delivery will also include a Knowledge Transfer and Training Workshop consisting of a 1 Hour Knowledge Transfer and Training Workshop as well as a Usage Guide for future use.

On-going Project Activities

1. Project Management

   a. Throughout the project, 1Spatial will provide project management to ensure on time deliveries and raise concerns quickly. 1Spatial uses a combination of the Rational Unified Process and AGILE project management to create and maintain a plan for delivery.
   b. During this project we suggest using biweekly status reporting to ensure that the team (both 1Spatial and Michigan members) are in constant contact and do not duplicate efforts. 1Spatial plans for meetings to demonstrate progress at times and dates convenient to Michigan
2. Documentation
   a. 1Spatial will document the test cases in two ways.
      i. Populating the Description field visible on the Rule Authoring Interface
      ii. Creating test cases with input scenarios and expected output.
   b. The tests cases will be provided as an Esri File GeoDatabase for future user.

Risks

1. Example data to be provided by Michigan prior to the beginning of work. Format has been agreed to be Esri File Geodatabase. Any alteration from this raises the risk of the format not being supported. An alteration would require a re-assessment of this SOW with potential increase in associated costs.
2. Data drawn from outside MGF data structure, for conflation, would present unknown risks and is to be considered exempt from this conflation process.
3. Availability of Michigan staff to regularly utilize 1Integrate in order to become adept in rule authoring abilities.
4. Deviation from pre-agreed testcases, discussed during elaboration phase, would result in delay of delivery and a potential increase in associated costs.
5. Deployment to additional environments requiring additional IT approvals for access

Pre-requisites

1. Example data to be provided by Michigan, in Michigan Georef (3078) prior to the beginning of work.
   a. County, Township, City, Village, and Road
   b. US Census Blocks

Assumptions

1. All supplied data will be in FGDB format
2. All spatial data will be in the SDE or FGDB format
3. All spatial data will be in the Michigan Georeference (EPSG:3078)
4. 1Spatial will leverage the example data provided

5. Availability of Michigan staff to regularly utilize 1Integrate in order to become adept in rule authoring abilities.
6. MGF Data will be drawn from Spatial Data Infrastructure (Michigan's Geospatial Framework - MGF).
7. Michigan will provide lookup tables for the hierarchy from the Census Blocks and to the derived layers
    a. Census Block Group
    b. Census Tract
    c. US House (US Congress)
    d. State House
    e. State Senate
8. 1Spatial will use 1Spatial's existing Michigan Development Environment

Test Strategy

User acceptance testing will be performed by Michigan using rules delivered by 1Spatial. 1Spatial expects Michigan to complete testing of components within 2 weeks of latest delivery with acceptance or rejection. In the event of rejection, customer will provide information on why the delivery does not meet the agreed statement of work and 1Spatial will make necessary adjustments and will redeliver. Acceptance billing will be invoiced upon acceptance of the delivery or 2 weeks after delivery without response from customer whichever is sooner.

Support as part of Michigan's current support arrangement will be provided, however additional rule creation and updates to the solution will be considered out of scope. These may be handled through a change order to this SOW or by an agreement for additional work detailed by a future SOW.

Project Timeline and Billing

Task	Description	Estimate Delivery	Price
Kickoff			$12,000
Data Quality Report			$15,000
Delivery of Aligned Census Blocks			$29,000
Deployment of Solution on Michigan Environment			$10,000

Support Deployment to additional environments			$1,000
Generate Higher Level Legislative Boundaries (optional)			$4,500
Deployment to UAT (Optional)			$2,000
Deployment to Production (Optional)			$2,000
Total:	**Non-Optional**		**$68,000**
Grand Total:	**With Optional Components**		**$76,500**

STATE OF MICHIGAN
CENTRAL PROCUREMENT SERVICES
Department of Technology, Management, and Budget
525 W. ALLEGAN ST., LANSING, MICHIGAN 48913
P.O. BOX 30026 LANSING, MICHIGAN 48909

CONTRACT CHANGE NOTICE

Change Notice Number **1**

to

Contract Number **200000000971**

CONTRACTOR	
	1SPATIAL, INC.
	8614 Westwood Center Dr. Suite 450
	Vienna, VA 22182
	Sheila Steffenson
	210-863-4948
	sheila.steffenson@1spatial.com
	CV0136125

STATE			
	Program Manager	Mark Holmes	DTMB
		517-241-6469	
		Holmesm3@Michigan.gov	
	Contract Administrator	Sean Regan	DTMB
		(517) 243-8459	
		regans@michigan.gov	

CONTRACT SUMMARY

GEOSPATIAL INTEGRATION SOFTWARE AND SERVICES

INITIAL EFFECTIVE DATE	INITIAL EXPIRATION DATE	INITIAL AVAILABLE OPTIONS	EXPIRATION DATE BEFORE
June 10, 2020	June 10, 2025	5 - 1 Year	June 10, 2025

PAYMENT TERMS	DELIVERY TIMEFRAME

ALTERNATE PAYMENT OPTIONS			EXTENDED PURCHASING	
☐ P-Card	☐ PRC	☐ Other	☒ Yes	☐ No

MINIMUM DELIVERY REQUIREMENTS

DESCRIPTION OF CHANGE NOTICE

OPTION	LENGTH OF OPTION	EXTENSION	LENGTH OF EXTENSION	REVISED EXP. DATE
☐		☐		June 10, 2025

CURRENT VALUE	VALUE OF CHANGE NOTICE	ESTIMATED AGGREGATE CONTRACT VALUE
$2,900,000.00	$0.00	$2,900,000.00

DESCRIPTION

Effective June 1, 2021, this contract is hereby amended to include two statement of works. The first statement of work is for the assistance with standarizing a statewide culvert schema and proposal for data quality business rules & data maintenance workflow. The second statement of work is for assistance updating the Michigan Geographic Framework workflows to handle Trail & Railroad submissions from MDOT.

All other terms, conditions, specifications, and pricing remain the same. Per Contractor, agency and DTMB Central Procurement Services approval.

8614 Westwood Center Dr., Suite 450
Vienna, VA 22182-2278 USA

Phone: 703-444-9488
Fax: 703-444-4922

Executive Summary

1Spatial is pleased to submit this proposed Statement of Work (SOW) to CSS in response to the request to assist CSS with Standardizing a Statewide Culvert Schema and Proposal for Data Quality Business Rules & Data Maintenance Workflow.

1Spatial Summary

1Spatial is a software solutions provider and global leader in managing geospatial data. We work with our clients to deliver real value by making data current, complete and consistent through the use of automated processes - ensuring that decisions are always based on the highest quality information available.

Our unique, rules-based approach delivers enterprise-scale, cross-platform, automation to all stages of the data lifecycle. It builds confidence in the data while reducing the time and cost of stewardship.

Our global clients include utility and telecommunications businesses, national mapping and land management agencies, government departments, emergency services, defense, census bureaus and transportation organizations.

As a leader in our field, we have a wealth of experience and a record of continual innovation and development. We partner with some of the leading technology vendors including Esri, Oracle, and SAP. For more information visit www.1spatial.com.

1Integrate Summary

1Spatial's 1Integrate Commercial off the Shelf (COTS) products stand apart from all other data QA/QC packages for several reasons. The 1Spatial COTS rules engine is unique in its flexibility and configurability to handle a variety of data challenges such as undershoots, overshoots, gaps, overlaps, attribution errors, alignment issues, etc. Our rules-based, automated engine goes beyond just locating errors as it also allows for "action" rules that can automate repairs to the data.

Traditionally, 1Integrate has been used in the following scenarios:

- Validation – rules define how the data should exist. The engine identifies any feature that does not conform to the standard.
- Correction – rules define how data should be changed to conform to the standard.
- Integration – rules define how data sets should be combined to meet the standard including:
    - Change detection – identifying how multiple datasets depict the same location. Changes can be identified between different providers, multiple vintages of the same provider, or multiple vintages from different providers.

- Data Integration – apply changes identified during change detection to update one or more datasets.
- Data Fusion – combining multiple siloed datasets to create a new dataset with information unavailable in an individual silo.
- Schema Transformation – applying rules to transform between schema definitions and identifying what the source does not provide but is needed by the target.

Additionally, 1Integrate utilizes our proprietary object-oriented cache which was developed to handle both large volumes of data as well as complex data processing tasks. The object-oriented nature of the cache provides for scalable performance even when the complexity of the rules or actions increases. 1Integrate leverages the object-orientated cache to provide the flexibility to work with a variety of schemas and file types, making 1Integrate client agnostic.

For these reasons, we are unique in the market and are unaware of any other packages that have all these capabilities without the requirement of custom development by a software engineer.

Project Methodology

1Spatial implements projects using a combination of the IBM Rational Unified Process (RUP) and Agile concepts. RUP consists of 4 phases (Inception, Elaboration, Construction, and Transition).

1. Inception begins with a project kick off and the establishment of project management
2. Elaboration focuses on high-level project design and workshops to gather documentation necessary to complete the project
3. Construction consists schema, business rule, and workflow design as well as report authoring
4. Transition focuses on provision of documentation and any remaining project components to the customer

Following Agile processes, weekly sprint meetings will be held with the customer to review:

1. Work completed (may include demonstrations)
2. Issues encountered
3. Plans for the next set of priorities

These weekly meetings may be extended to a bi-weekly basis after the first two weekly meetings if deemed appropriate by all involved.

1Spatial will also conduct daily internal standups with the rule implementation team. The daily standups will focus on similar topics on a smaller scale and members of the CSS may be invited if their input is required.

The following activities & deliverables have been identified for this project:

Project Activities

Inception

1Spatial will conduct a kickoff meeting to introduce and review the goals of the project with CSS. Following on from the kickoff, 1Spatial will conduct a planning workshop with CSS to agree on the

- messaging to data stewards (reasons and goals of the project)
- initial workshop schedule
- milestone dates

CSS will provide the documentation detailing current processes, schemas, business rules, and workflows required for the completion of the project to 1Spatial. 1Spatial will review the documents provided in preparation for the workshops during Elaboration.

Elaboration

1Spatial will conduct one workshop with each of the four data stewards. 1Spatial will provide an agenda and workshop goals prior to each scheduled workshop. After the workshop, 1Spatial will document and catalog the schema, business rules, and questions.

- Workshop: (2 hours)
    1. provide an overview of the process, goals and challenges
    2. review the data steward's existing culvert schemas, business rules, and workflows
    3. identify any documentation gaps

1Spatial will collate and provide workshop notes for the data stewards to review. Additionally, 1Spatial plans on recording the workshops for reference and can optionally provide the recordings.
1Spatial will be provided any additional documentation necessary for the completion of the project that may have been identified during the course of workshops with the culvert data stewards.

Construction

Based on the information gathered during the data steward workshops, 1Spatial will begin to author the Recommendations Report for CSS. 2 weeks after the fourth workshop, 1Spatial will conduct a workshop with CSS to

1. review challenges to a unified schema identified in the Elaboration phase
2. discuss risks, issues, and gap analyses
3. discuss current and planned down-stream products the schema will support

1Spatial will finalize the Recommendations Report with recommendations on how to integrate Culvert data into the Michigan Geographic Framework through these three sections:

1. Recommendations for a unified schema. This will include a
    a. data dictionary of currently present attributes.
    b. identification of shared attributes.
    c. recommended attributes which may be present in some schemas or are not present at all.
    d. Attribute authority and priority will also be considered.
2. Recommendations for business rules to run on data within the unified schema
3. Recommendations for a workflow to load and validate Culvert data into the Michigan Geographic Framework using the unified schema and recommended business rules.

After the report has been authored, 1Spatial will conduct a short workshop with CSS to review the final presentation prior to delivery.

Transition
1Spatial will conduct a final workshop with CSS and the data stewards to walk through the summary of recommendations presentation.

Delivery
All artifacts created during the construction phase will be turned over to the CSS.

5 deliverables will be provided in the Delivery phase:
1. A report detailing recommendations as outlined under the Construction Phase
2. A presentation summarizing the report
3. A Conceptual Rule Catalog as an appendix to the report
4. A Conceptual/Physical Culvert Data Model, with a data dictionary as an appendix to the report and an empty file geodatabase containing the unified schema. The data dictionary will include documentation on the specific providers and owners of attributes when applicable
5. A Workflow Diagram as an appendix to the report

On-going Project Activities
1. Project Management
    a. Throughout the project, 1Spatial will provide project management to ensure on time deliveries and raise concerns quickly. 1Spatial uses a combination of the Rational Unified Process and AGILE project management to create and maintain a plan for delivery.
    b. During this project we suggest using biweekly status reporting to ensure that the team (both 1Spatial and CSS members) are in constant contact and do not duplicate efforts. 1Spatial plans for meetings to demonstrate progress at times and dates convenient to the CSS

Risks

1. Existing Culvert Data/Schema Documentation/Proprietary Data Sharing Availability: in order for 1Spatial to provide the most accurate recommendations within the report

deliverable, 1Spatial will need access to thorough and accurate documentation (including documents detailing current processes, schemas, business rules, and workflows). There is a risk to the project timeline should 1Spatial be unable to obtain necessary documents in a timely fashion or at all.
2. Appropriate People not available for Workshops. Additional Workshops would be required because of attendee availability or preparedness.

Pre-requisites

1. Culvert documentation to be provided by CSS prior to the beginning of work. This includes:
    a. Culvert Database schemas for all data stewards
    b. Existing business rules - if documented by the data steward
    c. Existing Data Maintenance workflows – if documented by the data steward

Assumptions

1. Any output schedule will purely list the number of days and will not incorporate weekends, public holidays, and any other alterations to the work schedule.
2. Business rules will only be documented in a Rules Catalog. No rules will be authored.
3. 1Spatial will update the presentation once based on the review from CSS
4. 1Spatial will not provide review and edit cycles with the Recommendations Report

Project Timeline and Billing

This project will be a time and materials project using the following rates.

Position	Hourly Rate
Consultant	$180
Senior Consultant	$230
Principal Consultant	$275
Senior Software Engineer	$300
Director of Consultancy	$350

The table below represents an estimate of the costs and schedule.

Task	Description	Estimate Delivery (business weeks after award)	Price
Kickoff	Project Kickoff	2	$6,000
Data Steward Workshops	1Spatial will host 4 workshops with the Data Stewards	4	$15,000

CSS Workshop	1Spatial will host 1 workshop with CSS	5	$6,000
Recommendations	Includes the final documents and presentation	8	$23,000
Total (Not to Exceed):			**$55,000**

8614 Westwood Center Dr., Suite 450
Vienna, VA 22182-2278 USA

Phone: 703-444-9488
Fax: 703-444-4922

Executive Summary

1Spatial is pleased to submit this proposed Statement of Work (SOW) to CSS in response to the request to assist CSS with the update of the Michigan Geographic Framework (MGF) workflows to handle Trail and Railroad submissions from MDOT.

1Spatial Summary

1Spatial is a software solutions provider and global leader in managing geospatial data. We work with our clients to deliver real value by making data current, complete and consistent through the use of automated processes - ensuring that decisions are always based on the highest quality information available.

Our unique, rules-based approach delivers enterprise-scale, cross-platform, automation to all stages of the data lifecycle. It builds confidence in the data while reducing the time and cost of stewardship.

Our global clients include utility and telecommunications businesses, national mapping and land management agencies, government departments, emergency services, defense, census bureaus and transportation organizations.

As a leader in our field, we have a wealth of experience and a record of continual innovation and development. We partner with some of the leading technology vendors including Esri, Oracle, and SAP. For more information visit www.1spatial.com.

1Integrate Summary

1Spatial's 1Integrate Commercial off the Shelf (COTS) products stand apart from all other data QA/QC packages for several reasons. The 1Spatial COTS rules engine is unique in its flexibility and configurability to handle a variety of data challenges such as undershoots, overshoots, gaps, overlaps, attribution errors, alignment issues, etc. Our rules-based, automated engine goes beyond just locating errors as it also allows for "action" rules that can automate repairs to the data.

Traditionally, 1Integrate has been used in the following scenarios:

- Validation – rules define how the data should exist. The engine identifies any feature that does not conform to the standard.
- Correction – rules define how data should be changed to conform to the standard.
- Integration – rules define how data sets should be combined to meet the standard including:
    - Change detection – identifying how multiple datasets depict the same location. Changes can be identified between different providers, multiple vintages of the same provider, or multiple vintages from different providers.

- Data Integration – apply changes identified during change detection to update one or more datasets.
- Data Fusion – combining multiple siloed datasets to create a new dataset with information unavailable in an individual silo.
- Schema Transformation – applying rules to transform between schema definitions and identifying what the source does not provide but is needed by the target.

Additionally, 1Integrate utilizes our proprietary object-oriented cache which was developed to handle both large volumes of data as well as complex data processing tasks. The object-oriented nature of the cache provides for scalable performance even when the complexity of the rules or actions increases. 1Integrate leverages the object-orientated cache to provide the flexibility to work with a variety of schemas and file types, making 1Integrate client agnostic.

For these reasons, we are unique in the market and are unaware of any other packages that have all these capabilities without the requirement of custom development by a software engineer.

Project Methodology

1Spatial implements projects using a combination of the IBM Rational Unified Process (RUP) and Agile concepts. RUP consists of 4 phases (Inception, Elaboration, Construction, and Transition).

1. Inception begins with a project kick off and the establishment of project management
2. Elaboration focuses on building out the environment and high-level project design
3. Construction consists of rule and test case authoring
4. Transition focuses on provision of documentation and any remaining project components to the customer

Following Agile processes, weekly sprint meetings will be held with the customer to review:

1. Work completed (may include demonstrations)
2. Issues encountered
3. Plans for the next set of priorities

These weekly meetings may be extended to a bi-weekly basis after the first two weekly meetings if deemed appropriate by all involved.

1Spatial will also conduct daily internal standups with the rule implementation team. The daily standups will focus on similar topics on a smaller scale and members of CSS maybe be invited if their input is required.

The following activities & deliverables have been identified for this project:

Project Activities

Inception
1Spatial will review the schema of the MDOT supplied data and the target MGF schema for Trail and Railroad. Any suggested changes will occur during Elaboration.

Elaboration
1Spatial will recommend schema changes and work with CSS to implement the schema changes to the MGF Trail and Railroad.

1Spatial will update the

- ContributorLayer table to specify the appropriate target classes
- Python to populate additional attributes (as required)
- Python to update the Data Store mapping (as required)

1Spatial will hold a workshop with CSS to understand the relationships between Railroad and other features. We currently split roads when the road crosses:

- Another road
- A railroad
- A boundary (County, City, Township, Village, School District, Census Block, State Senate, State House, US Congress)
- An NHDLine feature

The discussion will be around if or when the Railroad needs to be split. NOTE existing logic will be used to split roads crossing railroads.

Construction
1Spatial will update the MDOT Road workflow to handle Trails and Roads. Currently the workflow handles Roads (from the PRMP_Road feature layer and Lrs_Edit_Log_Road table). The Trails in MGF are also stored on the Road feature class with additional attribution stored in the Trail table. After a review, the current MDOT Road workflow handles the majority of updates for the Trail submission. New actions will be created to identify a Trail PR in the submission and to handle the creation of the record in the Trail table for the CREATE Activity.

1Spatial will create a new MDOT Railroad workflow. This workflow will be based on the MDOT Road workflow for Contributor Load and Change Detection. 1Spatial will review the MDOT Road workflow for potentially shared logic and document the portions of logic to move into templates.

As the MDOT Road workflow is copied, 1Spatial will continue to review for opportunities to leverage templates for logic shared between the MDOT Road+Trail workflow and the MDOT Railroad workflow. The use of templates will reduce maintenance when updates are required for the MDOT workflows.

1Spatial will create a new MDOT Railroad MGF Update session which will be based on applying the proposals to the MGF database. The workshop during elaboration will dictate the situations where a railroad will be split. Actions to support the railroad splitting will be implemented during the creation of the MGF Update.

Transition
1Spatial will focus on the testing the workflow updates for Trail and Railroad. Trail tests will also be a regression against MDOT Road since the Trails and Roads will be processed together.

1Spatial will push the updates to the rule logic and python scripts to the development server. On the development server 1Spatial perform regression testing for the MDOT Road workflow as well as test the new enhancements for MDOT Trail.

1Spatial will test the MDOT Railroad workflow.

After 1Spatial testing on Michigan's Development environment, 1Spatial will support the Michigan testing team testing the updates in the Michigan UAT (QA) environment. We expect the testing to take 2 weeks total (1 week for each layer) but will support refinements through acceptance.

Delivery
All artifacts created during the construction phase will be turned over CSS.

On-going Project Activities
1. Project Management
    a. Throughout the project, 1Spatial will provide project management to ensure on time deliveries and raise concerns quickly. 1Spatial uses a combination of the Rational Unified Process and AGILE project management to create and maintain a plan for delivery.
    b. During this project we suggest using biweekly status reporting to ensure that the team (both 1Spatial and CSS members) are in constant contact and do not duplicate efforts. 1Spatial plans for meetings to demonstrate progress at times and dates convenient to CSS
2. Testing
    a. 1Spatial plans on using existing data from MDOT (specifically the extraction covering January 1, 2020 – December 31, 2020) for testing purposes.

Risks

1. Example data to be provided by CSS prior to the beginning of work. Format has been agreed to be Esri's FGDB extracted from MDOT's Roads and Highways Esri Enterprise Geodatabase. Any alteration from this raises the risk of the format not being supported. An alteration would require a re-assessment of this SOW with potential increase in associated costs.

Pre-requisites

1. Example data to be provided by CSS prior to the beginning of work.

Assumptions

1. Any output schedule will purely list the number of days and will not incorporate weekends, public holidays, and any other alterations to the work schedule.
2. Reporting of schedule will be written back out to a table stored in the original database from which the data was read in.
3. Availability of CSS staff to regularly utilize 1Integrate in order to become adept in rule authoring abilities.

Test Strategy

User acceptance testing will be performed by CSS using rules provided by 1Spatial during the delivery phase. Support as part of CSS current support arrangement will be provided, however additional rule creation and updates to the solution will be considered out of scope. These may be handled by an agreement for additional work detailed by a future SOW.

Project Timeline and Billing

Task	Description	Estimate Delivery	Price
Railroad Workshop			$10,000
Trail Workflow Updates			$11,750
Trail Workflow Acceptance			$12,000
Railroad Workflow Updates			$12,000
Railroad Workflow Acceptance			$12,000
Total:			**$57,750**

STATE OF MICHIGAN PROCUREMENT

Department of Technology, Management & Budget

525 W. Allegan St. Lansing MI, 48933

NOTICE OF CONTRACT

NOTICE OF CONTRACT NO. 200000000971
between
THE STATE OF MICHIGAN
and

CONTRACTOR	
	1Spatial Inc.
	8614 Westwood Center Dr. Suite 450
	Vienna VA, 22182
	Sheila Steffenson
	210-863-4948
	Sheila.Steffenson@1spatial.com
	CV0136125

STATE			
	Program Manager	Mark Holmes	DTMB
		517-241-6469	
		Holmesm3@michigan.gov	
	Contract Administrator	Jordan Sherlock	DTMB
		517-243-5556	
		Sherlockj@michigan.gov	

CONTRACT SUMMARY			
DESCRIPTION:Geospatial Integration Software & Services			
INITIAL EFFECTIVE DATE	**INITIAL EXPIRATION DATE**	**INITIAL AVAILABLE OPTIONS**	**EXPIRATION DATE BEFORE CHANGE(S) NOTED BELOW**
6/10/2020	6/10/2025	5, 1 Year	6/10/2025
PAYMENT TERMS		**DELIVERY TIMEFRAME**	
Net 45		N/A	
ALTERNATE PAYMENT OPTIONS			**EXTENDED PURCHASING**
☐ P-card ☐ Payment Request (PRC) ☐ Other			☒ Yes ☐ No
MINIMUM DELIVERY REQUIREMENTS			
N/A			
MISCELLANEOUS INFORMATION			
N/A			
ESTIMATED CONTRACT VALUE AT TIME OF EXECUTION			**$2,900,000**

FOR THE CONTRACTOR:

1Spatial Inc.

Company Name

Authorized Agent Signature

Sheila Steffenson

Authorized Agent (Print or Type)

5/17/2020

Date

FOR THE STATE:

Signature

Simon Baldwin, IT Category Manager
Name & Title

DTMB, Central Procurement
Agency

6/9/2020
Date

.;

STATE OF MICHIGAN

CONTRACT TERMS

This Software Contract (this "**Contract**") is agreed to between the State of Michigan (the "**State**") and 1Spatial Inc. ("**Contractor**"), a Delaware Corporation. This Contract is effective on [June, 10th, 2020] ("**Effective Date**"), and unless earlier terminated, will expire on [June, 10, 2025] (the "**Term**").

This Contract may be renewed for up to [5] additional [1] year periods. Renewal must be by written notice from the State and will automatically extend the Term of this Contract.

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

"**Acceptance**" has the meaning set forth in **Section 12.5**.

"**Acceptance Tests**" means such tests as may be conducted in accordance with **Section 12** and the Statement of Work to determine whether the Software meets the requirements of this Contract and the Documentation.

"**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 26.3(b)(ii)**.

"**API**" means all Application Programming Interfaces and associated API Documentation provided by Contractor, and as updated from time to time, to allow the Software to integrate with various State and Third Party Software.

"**Approved Open-Source Components**" means Open-Source Components that may be included in or used in connection with the Software and are specifically identified in an exhibit to the Statement of Work, and approved by the State.

"**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 Owner" is the individual appointed by the agency buyer to (a) act as the agency's representative in all matters relating to the Contract, and (b) co-sign off on notice of Acceptance for the Software. The Business Owner will be identified in the Statement of Work.

"**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 the 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 20.1.**

"**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 the 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 RFP.

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

"**Contractor's Test Package**" has the meaning set forth in **Section 11.2**.

"**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 the Statement of Work.

"**Dispute Resolution Procedure**" has the meaning set forth in **Section 31.1**.

"**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 collectively, the License Fees, Implementation Fees, and Support Services Fees.

"**Financial Audit Period**" has the meaning set forth in **Section 29.1**.

"**Force Majeure**" has the meaning set forth in **Section 32.1.**

"**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, distort, modify, 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 or Contractor Systems 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 19.1**.

"**Implementation Fees**" has the meaning set forth in **Section 16.2**.

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

"Integration Testing" has the meaning set forth in **Section 12.1(c)**.

"**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 Statement of Work.

"**Law**" means any statute, law, ordinance, regulation, rule, code, order, constitution, treaty, common law, judgment, decree or other requirement or rule of any federal, state, local or foreign government or political subdivision thereof, or any arbitrator, court or tribunal of competent jurisdiction.

"**License Agreement**" has the meaning set forth in **Section 3.**

"**License Fee**" has the meaning set forth in **Section 15.1**.

"**Loss or Losses**" means all losses, 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 and Support Schedule**" means the schedule attached as **Schedule E**, setting forth the Support Services Contractor will provide to the State, and the parties' additional rights and obligations with respect thereto.

"**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 the 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 the Statement of Work.

"**New Version**" means any new version of the Software 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.

"**Nonconformity**" or **"Nonconformities"** means any failure or failures of the Software to conform to the requirements of this Contract, including any applicable Documentation.

"**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.

"**Open-Source License**" has the meaning set forth in **Section 4.**

"**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 the Statement of Work, including such structural, functional and other features, conditions and components as hardware, operating software and system architecture and configuration.

"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**" has the meaning set forth in **Section 8.4**.

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

"**Pricing**" means any and all fees, rates and prices payable under this Contract, including pursuant to any Schedule or Exhibit hereto.

"**Pricing Schedule**" means the schedule attached as **Schedule C**, setting forth the License Fees, Implementation Fees, Support Services Fees, and any other fees, rates and prices payable under this Contract.

"**Project Manager**" is the individual appointed by each party to (a) monitor and coordinate the day-to-day activities of this Contract, and (b) for the State, to co-sign off on its notice of Acceptance for the Software. Each party's Project Manager will be identified in the Statement of Work.

"**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 Contractor is required to or otherwise does provide under this Contract, the Statement of Work, the Maintenance and Support Schedule (if applicable), or the Service Level Agreement (if applicable).

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

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

"**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 the Statement of Work.

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

"**State Data**" has the meaning set forth in **Section 19.1**.

"**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 Resources**" has the meaning set forth in **Section 10.1(a)**.

"**Statement of Work**" means any statement of work entered into by the parties and attached as a schedule to this Contract. The initial Statement of Work is attached as **Schedule B**, and subsequent Statements of Work shall be sequentially identified and attached as Schedules B-1, B-2, B-3, etc.

"**Stop Work Order**" has the meaning set forth in **Section 24**.

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

"**Support Services Commencement Date**" means, with respect to the Software, the date on which the Warranty Period for the Software expires or such other date as may be set forth in the Statement of Work.

"**Support Services Fees**" has the meaning set forth in **Section 16.3**.

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

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

"**Test Data**" has the meaning set forth in **Section 11.2**.

"**Test Estimates**" has the meaning set forth in **Section 11.2**.

"**Testing Period**" has the meaning set forth in **Section 12.1(b)**.

"**Third Party**" means any Person other than the State or Contractor.

"**Transition Period**" has the meaning set forth in **Section 23.3**

"**Transition Responsibilities**" has the meaning set forth in **Section 23.3**.

"**Unauthorized Removal**" has the meaning set forth in **Section 9.3(b)**.

"**Unauthorized Removal Credit**" has the meaning set forth in **Section 9.3(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.

"WCAG 2.0 Level AA" means level AA of the World Wide Web Consortium (W3C) Web Content Accessibility Guidelines (WCAG) version 2.0.

"**Warranty Period**" means the ninety (90) calendar-day period commencing on the date of the State's Acceptance of the Software.

"**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 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. Application Program Interfaces (APIs), authored rules and scripts are excluded from this definition.

2. Statements of Work. Contractor shall provide Services and Deliverables pursuant to Statements of Work entered into under this Contract. No Statement of Work shall be effective unless signed by each party's Contract Administrator. The term of each Statement of Work shall commence on the parties' full execution of the 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 attached as a schedule to this Contract. The State shall have the right to terminate such Statement of Work as set forth in **Section 23**. 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.

2.1 Statement of Work Requirements. Each Statement of Work will include the following:

(a) names and contact information for Contractor's Contract Administrator, Project Manager and Key Personnel;

(b) names and contact information for the State's Contract Administrator, Project Manager and Business Owner;

(c) a detailed description of the Services to be provided under this Contract, including any training obligations of Contractor;

(d) a detailed description of the Software to be provided under this Contract, including the:

(i) version and release number of the Software;

(ii) Business Requirements Specification;

(iii) Technical Specification; and

(iv) a description of the Documentation to be provided;

(e) an Implementation Plan, including all Milestones, the corresponding Milestone Dates and the parties' respective responsibilities under the Implementation Plan;

(f) the due dates for payment of Fees and any invoicing requirements, including any Milestones on which any such Fees are conditioned, and such other information as the parties deem necessary;

(g) disclosure of all Open-Source Components (each identified on a separate exhibit to the Statement of Work), in each case accompanied by such related documents as may be required by this Contract;

(h) description of all liquidated damages associated with this Contract; and

(i) a detailed description of all State Resources required to complete the Implementation Plan.

2.2 Change Control Process. The State may at any time request in writing (each, a "**Change Request**") changes to the 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 the 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 the 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 the 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 the Statement of Work, terminate this Contract under **Section 23**.

(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 the Statement of Work pending negotiation and execution of a Change Notice. Any work completed by Contractor during the course of negotiation and execution of the Change Request will be billable to the state provided the work completed is authorized under the current Statement of Work. Contractor will not perform work unless authorized under the current Statement of Work and will not perform any new or additional work being considered under a Statement of Work that is pending until the Statement of Work has been included in the Contract via 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.

3. Software License. Contractor hereby grants to the State and its Authorized Users the right and license to use the Software and Documentation in accordance with the terms and conditions of this Contract and the License Agreement set forth in **Schedule D** (the "**License Agreement**").

4. Open-Source Licenses. Any use hereunder of Open-Source Components shall be governed by, and subject to, the terms and conditions of the applicable open-source license ("**Open-Source License**"). Contractor shall identify and describe in an exhibit to the Statement of Work each of the Approved Open-Source Components of the Software, and include an exhibit attaching all applicable Open-Source Software Licenses or identifying the URL where these licenses are publicly available.

5. Software Implementation.

5.1 Implementation. Contractor will 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 the Statement of Work.

5.2 Site Preparation. Unless otherwise set forth in the 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 the 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. The State is

responsible for Site preparation, Contractor will provide such assistance as the State requests to complete such preparation on a timely basis.

6. Support Services

6.1 Support Services for On-Premise Software. Contractor shall provide the State with the Support Services described in the Maintenance and Support Schedule attached as **Schedule E** to this Contract. Such Support Services shall be provided:

(a) Free of charge during the Warranty Period, it being acknowledged and agreed that the License Fee includes full consideration for such Services during such 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 Support Services Fees in accordance with **Section 15** and the rates set forth in the Pricing Schedule.

7. Data Privacy and Information Security.

7.1 Undertaking by Contractor. Without limiting Contractor's obligation of confidentiality as further described, 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 State Data; and (e) ensure that all Contractor and Subcontractor(s) Representatives comply with all of the foregoing. 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 State IT policies and standards, of which the publicly available ones are located at https://www.michigan.gov/dtmb/0,5552,7-358-82547_56579_56755---,00.html.

7.2 To the extent that Contractor has access to the State's computer system, 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 the State's system. The State reserves the right to terminate Contractor's access to the State's system if a violation occurs.

7.3 Right of Audit by the State. 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. During the providing of Services, on an ongoing basis from time to time and without notice, 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. In lieu of an on-site audit, upon request by the State, Contractor agrees to complete, within forty-five (45) calendar days of receipt, an audit questionnaire provided by the State regarding Contractor's data privacy and information security program.

7.4 Audit Findings. 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.

7.5 State's Right to Termination for Deficiencies. The State reserves the right, at its sole election, to immediately terminate this Contract or the Statement of Work without limitation and without liability; excluding payment for services accepted by the state prior to termination. if the State determines that Contractor fails or has failed to meet its obligations under this **Section** 8.

8. Performance of Services. Contractor will provide all Services and Deliverables in a timely, professional and workmanlike manner and in accordance with the terms, conditions, and Specifications set forth in this Contract and the Statement of Work.

8.1 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, 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/Subcontractor 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/Subcontractor 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.

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

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

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

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

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

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

(d) Contractor will promptly replace its Project Manager on the occurrence of any event set forth in **Section 8.2(c)**. Such replacement will be subject to the State's prior written approval.

8.3 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's Project Manager, 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. An Unauthorized Removal also does not include replacing Key Personnel following a Stop Work Order that lasts for more than ten (10) business days. 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 22.1**.

(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 fix 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 22.1**, 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 (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.

8.4 Subcontractors. Contractor will not, without the prior written approval of the State, which consent may be given or withheld in the State's sole discretion, engage any Third Party to perform Services. The State's approval of any such Third Party (each approved Third Party, a "**Permitted Subcontractor**") 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 Permitted Subcontractor (including such Permitted Subcontractor's employees who, to the extent providing Services or Deliverables, shall 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.

9. State Obligations.

9.1 State Resources and Access. The State is responsible for:

(a) providing the State Materials and such other resources as may be specified in the Statement of Work (collectively, "**State Resources**") in a timely manner based on the project schedule; and

(b) providing Contractor Personnel with such access to the Site(s) and Operating Environment as is necessary for Contractor to perform its obligations on a timely basis as set forth in the Statement of Work.

9.2 State Project Manager. Throughout the Term of this Contract, the State will maintain a State employee to serve as the State's Project Manager under this Contract. The State's Project Manager will be identified in the Statement of Work. The State's Project Manager will be available as set forth in the Statement of Work.

10. Pre-Delivery Testing.

10.1 Testing By Contractor. Before delivering and installing the Software, Contractor must:

(a) test the Software to confirm that it is fully operable, meets all applicable Specifications and will function in accordance with the Specifications and Documentation when properly installed in the Operating Environment;

(b) scan the Software using industry standard scanning software and definitions to confirm it is free of Harmful Code; and

(c) remedy any Non-Conformity or Harmful Code identified and retest and rescan the Software.

10.2 Test Data and Estimates. Unless otherwise specified in the Statement of Work, Contractor shall provide to the State all test data and testing scripts used by Contractor for its pre-delivery testing ("**Test Data**"), together with the results Contractor expects to be achieved by processing the Test Data using the Software ("**Test Estimates**," and together with Test Data, "**Contractor's Test Package**").

11. Acceptance Testing.

11.1 Acceptance Testing.

(a) Unless otherwise specified in the Statement of Work, upon installation of the Software, Acceptance Tests will be conducted as set forth in this **Section 11** to ensure the Software conforms to the requirements of this Contract, including the applicable Specifications and Documentation. The State may, but is not obligated, to perform its own pretest on the Software utilizing Contractor's Test Package. If the State does perform a pretest, and Contractor's Test Package does not successfully pass the Test Data or Test Estimate scripts as described by Contractor, the State, at its discretion, is not obligated to move into the formal Acceptance Tests set forth in this Section. The State may elect to send Contractor's Test Package back to Contractor to correct any problems encountered with the Test Data or Test Estimates.

(b) All Acceptance Tests will take place at the designated Site(s) in the Operating Environment described in the Statement of Work, commence on the Business Day following installation of the Software and be conducted diligently for up to thirty (30) Business Days, or such other period as may be set forth in the Statement of Work (the "**Testing Period**"). 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, Contractor will make suitable Contractor Personnel available to observe or participate in such Acceptance Tests; and

(ii) for Acceptance Tests conducted by Contractor, the State has the right to observe or participate in all or any part of such Acceptance Tests.

Contractor is solely responsible for all costs and expenses related to Contractor's performance of, participation in, and observation of Acceptance Testing.

(c) Upon delivery and installation of any API, Configuration or Customization to the Software under the Statement of Work, additional Acceptance Tests will be performed on the modified Software as a whole to ensure full operability, integration, and compatibility among all elements of the Software ("**Integration Testing**"). Integration Testing is subject to all procedural and other terms and conditions set forth in **Section 11.1**, **Section 11.3**, and **Section 11.4**.

(d) The State may suspend Acceptance Tests and the corresponding Testing Period by written notice to Contractor if the State discovers a material Non-Conformity in the tested Software or part or feature of the Software. In such event, 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.

11.2 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 11.3** and **Section 11.4**.

(b) If such notice is provided by the State, is signed by the State's Business Owner and Project Manager, and identifies no Non-Conformities, such notice constitutes the State's Acceptance of such Software.

(c) If such notice is provided by Contractor and identifies no Non-Conformities, the State will have thirty (30) 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 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 11.3** and **Section 11.4**; or

(ii) provide Contractor with a written notice of its Acceptance of such Software, which must be signed by the State's Business Owner and Project Manager.

11.3 Failure of Acceptance Tests. If Acceptance Tests identify any Non-Conformities in the software, Contractor, at 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, Contractor's:

(a) completion of such Acceptance Tests, in the case of Acceptance Tests conducted by Contractor; or

(b) receipt of the State's notice under **Section 11.1(a)** or **Section 11.2(c)(i)**, identifying any Non-Conformities.

11.4 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 Contractor fails to re-deliver the Software on a timely basis, the State may, in its sole discretion, by written notice to Contractor:

(a) continue the process set forth in this **Section 11**;

(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) 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 22.1**.

11.5 Acceptance. Acceptance ("**Acceptance**") of the Software (subject, where applicable, to the State's right to Integration Testing) will occur on the date that is the earliest of the State's delivery of a notice accepting the Software under **Section 11.2(b)**, or **Section 11.2(c)(ii)**.

12. Training. Contractor shall 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 the Statement of Work. Upon the State's request, Contractor shall 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.

13. Maintenance Releases; New Versions

13.1 Maintenance Releases. Provided that the State is current on its Support Services Fees, during the Term, Contractor shall 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.

13.2 New Versions. Provided that the State is current on its Support Services Fees, during the Term, Contractor shall 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.

13.3 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 shall 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 Schedule E Maintenance and Support.. Contractor shall 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.

14. Source Code Escrow

14.1 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.

15. Fees

15.1 License Fee. In consideration of, and as payment in full for, the rights and license to use the Software and Documentation as provided in this Contract and the License Agreement, the State shall pay to Contractor the license fees (the "**License Fee**") set forth on the Pricing Schedule, subject to and in accordance with the terms and conditions of this Contract and the License Agreement, including the applicable timetable and other provisions of the Statement of Work and this **Section 15**.

15.2 Implementation Fees. In consideration of, and as payment in full for, Contractor's provision of implementation services as provided in this Contract and the Statement of Work, the State shall pay to Contractor the implementation fees (the "**Implementation Fees**") set forth on the Pricing Schedule, subject to and in accordance with the terms and conditions of this Contract, including the applicable timetable and other provisions of the Statement of Work and this **Section 15**.

15.3 Support Service Fees. In consideration of Contractor providing the Support Services as required under the Maintenance and Support Schedule (as applicable) or the Service Level Agreement (as applicable), the State shall pay to Contractor the Support Services fees (the "**Support Service Fees**") set forth in the Pricing Schedule, subject to and in accordance with the terms and conditions of this Contract, including the applicable provisions of the Maintenance and Support Schedule (as applicable) or the Service Level Agreement (as applicable) and this **Section 15**.

15.4 Firm Pricing/Fee Changes. All Pricing set forth in this Contract is firm and will not be increased, except as otherwise expressly provided in this **Section 15.4**.

(a) The License Fee 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.

16. Invoices and Payment.

16.1 Invoices. Contractor will invoice the State for Fees in accordance with the requirements set forth in the Statement of Work, including any requirements that condition the rendering of invoices and the payment of Fees upon the successful completion of Milestones. Contractor must submit each invoice in both hard copy and electronic format, via such delivery means and to such address as are specified by the State in the Statement of Work. Each separate invoice must:

(a) clearly identify the Contract and purchase order number to which it relates, in such manner as is required by the State;

(b) list each Fee item separately;

(c) include sufficient detail for each line item to enable the State to satisfy its accounting and charge-back requirements;

(d) for Fees determined on a time and materials basis, report details regarding the number of hours performed during the billing period, the skill or labor category for such Contractor Personnel and the applicable hourly billing rates;

(e) include such other information as may be required by the State as set forth in the Statement of Work; and

(f) Itemized invoices must be submitted to DTMB-Accounts-Payable@michigan.gov.

16.2 Contractor will invoice for the initial year's software licenses upon delivery of software to SOM. Invoices for follow on years' software will be invoiced on or about October 15th to ensure payment by SOM prior to license expirationon December 31st of each calendar year. Invoices for deliverables will be billed on a monthly basis, as completed.

16.3 Payment. Invoices are due and payable by the State, in accordance with the State's standard payment procedures as specified in 1984 Public Act no. 279, MCL 17.51, et seq., within forty-five (45) calendar days after receipt, provided the State determines that the invoice was properly rendered. 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

16.4 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 inclusive 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.

16.5 Payment Disputes. The State may withhold from payment any and all payments and amounts the State disputes in good faith, pending resolution of such dispute, provided that the State:

(a) timely renders all payments and amounts that are not in dispute;

(b) notifies Contractor of the dispute prior to the due date for payment, specifying in such notice:

(i) the amount in dispute; and

(ii) the reason for the dispute set out in sufficient detail to facilitate investigation by Contractor and resolution by the parties;

(c) works with Contractor in good faith to resolve the dispute promptly; and

(d) promptly pays any amount determined to be payable by resolution of the dispute.

Contractor shall not withhold any Services or fail to perform any obligation hereunder by reason of the State's good faith withholding of any payment or amount in accordance with this **Section 16.4** or any dispute arising therefrom.

16.6 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 owing to it by Contractor against any amount payable by the State to Contractor under this Contract.

17. Intellectual Property Rights

17.1 Ownership Rights in Software

(a) Subject to the rights and licenses granted by Contractor in this Contract and the License Agreement, and the provisions of **Section 17.1(b)**:

(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.

(b) 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 User Data, including all Intellectual Property Rights arising therefrom or relating thereto.

17.2 Rights in Open-Source Components. Ownership of all Intellectual Property Rights in Open-Source Components shall remain with the respective owners thereof, subject to the State's rights under the applicable Open-Source Licenses.

17.3 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 Work Product.

18. State Data.

18.1 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 by the State 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) personal 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. 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. This **Section 18.1** survives termination or expiration of this Contract.

18.2 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; and (c) not use, sell, rent, transfer, distribute, 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. This **Section 18.2** survives termination or expiration of this Contract.

18.3 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, or integrity 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. The parties agree that any damages relating to a breach of this **Section 18.3** are to be considered direct damages and not consequential damages. This section survives termination or expiration of this Contract. This Section survives termination or expiration of this Contract.

18.4 Security Accreditation Process. Contractor must assist the State, at no additional cost, with 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. 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 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 and perform related remediation activities. 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.

19. Confidential Information. Each party acknowledges that it may be exposed to or acquire communication or data of the other party that is confidential in nature and is not intended to be disclosed to third parties. This **Section 19** survives termination or expiration of this Contract.

19.1 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; and, (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: (a) in the possession of the State and subject to disclosure under the Michigan Freedom of Information Act (FOIA); (b) already in the possession of the receiving party without an obligation of confidentiality; (c) developed independently by the receiving party, as demonstrated by the receiving party, without violating the disclosing party's proprietary rights; (d) obtained from a source other than the disclosing party without an obligation of confidentiality; or, (e) publicly available when received, or thereafter became publicly available (other than through any unauthorized disclosure by, through, or on behalf of, the receiving party). Notwithstanding the above, in all cases and for all matters, State Data is deemed to be Confidential Information.

19.2 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 Subcontractor(s) Representatives may be required to execute a separate agreement to be bound by the provisions of this **Section 19.2**.

19.3 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.

19.4 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.

19.5 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. If Contractor or the State determine that the return of any Confidential Information is not feasible, such party must destroy the Confidential Information and certify the same in writing within five (5) Business Days from the date of termination to the other party.

20. 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.

21. Accessibility Requirements.

a) 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:

i) 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;

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

iii) 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;

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

v) 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

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

b)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.

c)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 22.1**.

d)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

e)Failure to comply with the requirements in this **Section 21** shall constitute a material breach of this Contract.

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

22.1 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 22.1**, the State will issue a termination notice specifying whether Contractor must: (a) cease performance immediately, or (b)

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 convenience, effective as of the same date, and the rights and obligations of the parties will be limited to those provided in **Section 22.2**.

(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 Support Services 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.

22.2 Termination for Convenience. 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, or (b) continue to perform in accordance with **Section 22.3**. If the State terminates this Contract for convenience, the State will pay all reasonable costs, as determined by the State, for State approved Transition Responsibilities to the extent the funds are available.

22.3 Transition Responsibilities. 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: (a) continuing to perform the Services at the established Contract rates; (b) taking all reasonable and necessary measures to transition performance of the work, including all applicable Services to the State or the State's designee; (c) taking all necessary and appropriate steps, or such other action as the State may direct, to preserve, maintain, protect, or return to the State all State Data; and (d) 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.

22.4 Survival. This **Section 22** survives termination or expiration of this Contract.

23. Stop Work Order. The State may, at any time, order the Services of Contractor fully or partially stopped for its own convenience 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.

24. Contractor Representations and Warranties.

24.1 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.

24.2 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.

24.3 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) 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;

(d) 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;

(e) when used by the State or any Authorized User in accordance with this Contract and the Documentation, the Software 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;

(f) as provided by Contractor, the Software does not or will not at any time during the license term contain any:

(i) Harmful Code; or

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

(g) 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

(h) 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.

(i) 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; and

(j) 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.

24.4 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.

25. Indemnification

25.1 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; and (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).

25.2 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: (i) regular updates on proceeding status; (ii) participate in the defense of the proceeding; (iii) employ its own counsel; and to (iv) 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 25**, 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.

25.3 Infringement Remedies.

(a) The remedies set forth in this **Section 25.3** 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.

(b) 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:

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

(ii) 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.

(c) 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:

(i) 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 the Statement of Work for the Allegedly Infringing Materials that the State cannot reasonably use as intended under this Contract; and

(ii) 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.

(d) If Contractor directs the State to cease using any Software under **subsection (c)**, the State may terminate this Contract for cause under **Section 22.1**.

(e) Contractor will have no liability for any claim of infringement arising solely from:

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

(ii) modification of the Software by the State without the prior knowledge and approval of Contractor;

unless the claim arose against the Software independently of any of the above specified actions.

26. Liquidated Damages.

26.1 The parties agree that any delay or failure by Contractor to timely perform its obligations in accordance with the Implementation Plan and Milestone Dates agreed to by the parties will interfere with the proper and timely implementation of the Software, to the loss and damage of the State. Further, the State will incur major costs to perform the obligations that would have otherwise been performed by Contractor. The parties understand and agree that any liquidated damages Contractor must pay to the State as a result of such nonperformance are described in the Statement of Work, and that these amounts are reasonable estimates of the State's damages in accordance with applicable Law.

26.2 The parties acknowledge and agree that Contractor could incur liquidated damages for more than one event if Contractor fails to timely perform its obligations by each Milestone Date.

26.3 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 22.1**, 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.

26.4 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.

27. Damages Disclaimers and Limitations.

27.1 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.

27.2 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.

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

28.1 Right of Audit. 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.

28.2 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.

28.3 Application. This **Section 28** applies to Contractor, any Affiliate, and any Permitted Subcontractor that performs Services in connection with this Contract.

29. Insurance

(a) **Insurance Requirements.** Contractor must, at its sole expense, maintain the insurance coverage identified below. All required insurance must: (i) protect the State from claims that arise out of, are alleged to arise out of, or otherwise result from Contractor's or subcontractor's performance; (ii) be primary and non-contributing to any comparable liability insurance (including self-insurance) carried by the State; and (iii) be provided by an company with an A.M. Best rating of "A-" or better and a financial size of VII or better.

Insurance Type	Additional Requirements
Commercial General Liability Insurance	
Minimal Limits: $1,000,000 Each Occurrence Limit $1,000,000 Personal & Advertising Injury Limit $2,000,000 General Aggregate Limit $2,000,000 Products/CompletedOperations Deductible Maximum: $50,000 Each Occurrence	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 2010 07 04 and CG 2037 07 04.

Umbrella or Excess Liability Insurance	
Minimal Limits: $3,000,000 General Aggregate	Contractor's policy must follow form.
Automobile Liability Insurance	
Minimal Limits: $1,000,000 Per Occurrence	
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: (1) endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds; and (2) cover information security and privacy liability, privacy notification costs, regulatory defense and penalties, and website media content liability.

(b) If any of the required policies provide claims-made coverage, Contractor must: (i) provide coverage with a retroactive date before the Contract Effective Date or the beginning of Contract Activities; (ii) maintain coverage and provide evidence of coverage for at least three (3) years after completion of the Contract Activities; and (iii) if coverage is canceled 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 the Contract Activities.

(c) Contractor must: (i) provide insurance certificates to the Contract Administrator, containing the Contract Number, at Contract formation and within twenty (20) calendar days of the expiration date of the applicable policies; (ii) require that subcontractors maintain the required insurances contained in this Section; (iii) notify the Contract Administrator within five (5) business days if any insurance is cancelled; and (iv) waive all rights against the State for damages covered by insurance. Failure to maintain the required insurance does not limit this waiver.

29.2 Non-waiver. This **Section 29** is not intended to and is not 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).

30. Dispute Resolution.

30.1 Unless otherwise specified in the Statement of Work, the parties will endeavor to resolve any Contract dispute in accordance with **Section 30** (the "**Dispute Resolution Procedure**"). The initiating party will reduce its description of the dispute to writing (including all supporting documentation) and deliver it to the responding party's Project Manager. The responding party's Project Manager must respond in writing within five (5) Business Days. The initiating party has five (5) Business Days to review the response. If after such review resolution cannot be reached, both parties will have an additional five (5) Business Days to negotiate in good faith to resolve the dispute. If the dispute cannot be resolved within a total of fifteen (15) Business Days, the parties must submit the dispute to the parties' Contract Administrators. The parties will continue performing while a dispute is being resolved, unless the dispute precludes performance. A dispute involving payment does not preclude performance.

30.2 Litigation to resolve the dispute will not be instituted until after the dispute has been elevated to the parties' Contract Administrators, and either Contract Administrator 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 30** does not limit the State's right to terminate this Contract.

31. General Provisions

31.1 Force Majeure.

(a) Force Majeure Events. Subject to **Subsection (b)** below, neither party will be liable or responsible to the other party, or be deemed to have defaulted under or breached this 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 this 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**"), 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.

(b) State Performance; Termination. In the event of a Force Majeure Event affecting Contractor's performance under this Contract, the State may suspend its performance hereunder until such time as Contractor resumes performance. The State may terminate this 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 this Contract pursuant to the preceding sentence, any date specifically designated for Contractor's performance under this Contract will automatically be extended for a period up to the duration of the Force Majeure Event.

31.2 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.

31.3 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 or bind the other party in any manner whatsoever.

31.4 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.

31.5 Notices. All notices, requests, consents, claims, demands, waivers and other communications under this Contract must be in writing and addressed to the parties as follows (or as otherwise specified by a party in a notice given in accordance with this **Section 31.5**):

If to Contractor:	8614 Westwood Center Drive, Suite 450, Vienna, VA 22182	
	Email:	Sheila.steffenson@1spatial.com
	Attention:	Sheila Steffenson, CEO
If to State:	525 W. Allegan St. Lansing, Michigan 48933	
	Email:	Sherlockj@michigan.gov
	Attention:	Jordan Sherlock, Category Analyst.

Notices sent in accordance with this **Section 31.5** will be deemed effectively given: (a) when received, if delivered by hand (with written confirmation of receipt); (b) when received, if sent by a nationally recognized overnight courier (receipt requested); (c) on the date sent by e-mail (with confirmation of transmission), if sent during normal business hours of the recipient, and on the next

Business Day, if sent after normal business hours of the recipient; or (d) on the fifth (5th) day after the date mailed, by certified or registered mail, return receipt requested, postage prepaid.

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

31.7 Assignment. Contractor may not assign or otherwise transfer any of its rights, or delegate or otherwise transfer any of its obligations or performance, under this Contract, in each case whether voluntarily, involuntarily, by operation of law or otherwise, without the State's prior written consent. The State has the right to terminate this Contract in its entirety or any Services or Statements of Work hereunder, pursuant to **Section 23.1**, if Contractor delegates or otherwise transfers any of its obligations or performance hereunder, whether voluntarily, involuntarily, by operation of law or otherwise, and no such delegation or other transfer will relieve Contractor of any of such obligations or performance. For purposes of the preceding sentence, and without limiting its generality, any merger, consolidation or reorganization involving Contractor (regardless of whether Contractor is a surviving or disappearing entity) will be deemed to be a transfer of rights, obligations, or performance under this Contract for which the State's prior written consent is required. Any purported assignment, delegation, or transfer in violation of this **Section 31.7** is void. The Agreement or any rights under the Agreement may not be assigned by the State without the written approval of 1Spatial, The State shall not subcontract or otherwise deal with its rights and obligations arising under or in connection with this Agreement without 1Spatial's prior written consent.

31.8 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.

31.9 Amendment and Modification; Waiver. No amendment to or modification of this Contract is effective unless it is in writing, identified as an amendment to this Contract and signed by both parties Contract Administrator. Further, certain amendments to this Contract may require State Administrative Board Approval. No waiver by any party of any of the provisions of this Contract will be effective unless explicitly set forth in writing and signed by the party so waiving. Except as otherwise set forth in this Contract, no failure to exercise, or delay in exercising, any right, remedy, power, or privilege arising from this Contract will operate or be construed as a waiver. Nor will any single or partial exercise of any right, remedy, power or privilege under this Contract preclude the exercise of any other right, remedy, power or privilege.

31.10 Severability. If any term or provision of this Contract is invalid, illegal or unenforceable in any jurisdiction, such invalidity, illegality or unenforceability will not affect any other term or provision of this Contract or invalidate or render unenforceable such term or provision in any other jurisdiction. Upon such determination that any term or other provision is invalid, illegal or unenforceable, the parties hereto will negotiate in good faith to modify this Contract so as to effect the original intent of the parties as closely as possible in a mutually acceptable manner in order that the transactions contemplated hereby be consummated as originally contemplated to the greatest extent possible.

31.11 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 agents in Michigan to receive service of process.

31.12 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 31.12**.

31.13 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, Vendor 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.

31.14 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.

31.15 Schedules All Schedules that are referenced herein and attached hereto are hereby incorporated by reference.

31.16 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.

31.17 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 shall 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.

31.18 Compliance with Laws. Contractor and its Representatives must comply with all Laws in connection with this Contract.

31.19 Non-Exclusivity. Nothing contained in this Contract is intended nor is to be construed as creating any requirements contract with Contractor. This Contract does not restrict the State or its agencies from acquiring similar, equal, or like Services from other sources.

31.20 Administrative Fee and Reporting Contractor must pay an administrative fee of 1% on all payments made to Contractor under the Contract including transactions with the State (including its departments, divisions, agencies, offices, and commissions), MiDEAL members, and other states (including governmental subdivisions and authorized entities). Administrative fee payments must be made online by check or credit card:

State of MI Admin Fees: https://www.thepayplace.com/mi/dtmb/adminfee

State of Mi MiDEAL Fees: https://www.thepayplace.com/mi/dtmb/midealfee

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

31.21 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.

31.22 Entire Agreement. This Contract, together with all Schedules, Exhibits, and the Statement of Work which are hereby expressly incorporated, 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 body of this Contract, the Schedules, Exhibits, and the Statement of Work, the following order of precedence governs: (a) first, this Contract, excluding its Exhibits and Schedules, and the Statement of Work; and (b) second, the Statement of Work as of the Effective Date; and (c) third, the Exhibits and Schedules to this Contract as of the Effective Date. NO TERMS ON CONTRACTORS 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 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.

STATE OF MICHIGAN

Contract No. 200000000971
Geospatial Data Integration

Schedule A
Scope of Work

1. DEFINITIONS

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

Term	Definition
DTMB	Department of Technology Management & Budget
CSS	Center for Shared Solutions
SOM	State of Michigan
MGF	Michigan Geographic Framework

2. BACKGROUND

DTMB's Center for Shared Solutions (CSS) manages and maintains the Michigan Geographic Framework (MGF) platform and program. The MGF integrates data from multiple authoritative data sources to then publish out statewide integrated GIS data layers. CSS has managed the MGF for over twenty years and a technology refresh project began in 2017. The project solution implementation has run into delays and system performance issues that have resulted in working with the current vendors, ESRI Inc. and 1Spatial Inc., to evaluate the current architecture. The agreed upon changes required to make the solution fully functional involve moving the architected software solution to 1Spatial full 1Integrate Enterprise rather than the 1Integrate for ESRI ArcGIS Server version of their software. The 1Integrate Enterprise will provide better performance metrics to align with expectations from the State of Michigan (SOM) and make configuration and maintenance of the solution easier for SOM staff. To achieve this software migration, the SOM will need to enter into a standalone contract with 1Spatial.

3. PURPOSE

The purpose of this contract is for the contractor to install their 1Integrate Enterprise software and associated extensions. The 1Spatial rule engine is the core technology for the Michigan Geographic Framework GIS data integration project. This purchase would be for the following software and services; 1Spatial 1Integrate Enterprise Software and Extensions, Maintenance and Support for 1Spatial Software, Configuration Support for 1Spatial Software, and Pre-Configured Business Rules for 1Spatial Software.

4. CONTRACT TERM

The contract overall term is expected to be 5 years with 5, 1 year options

5. SPECIFIC STANDARDS

IT Policies, Standards and Procedures (PSP)

Contractors are advised that the State has methods, policies, standards and procedures that have been developed over the years. Contractors are expected to provide proposals that conform to State IT policies and standards. All services and products provided as a result of this contract must comply with all applicable State IT policies and standards. Contractor is required to review all applicable links provided below and state compliance in their response.

Public IT Policies, Standards and Procedures (PSP):
https://www.michigan.gov/dtmb/0,5552,7-358-82547_56579_56755---,00.html

Note: Not all applicable PSP's are available publicly.

Secure Application Development Life Cycle (SADLC)

Contractor is required to meet the States Secure Application Development Life Cycle requirements that includes:

Application Scanning

Contractor is required to grant the right to the State to scan either the application code or a deployed version of the solution; or in lieu of the State performing a scan, Contractor will provide the State a vulnerabilities assessment after Contractor has used a State approved application scanning tool. These scans must be completed and provided to the State on a regular basis or at least for each major release.

For COTS or Contractor owned applications, Contractor, at its sole expense, must provide resources to complete the scanning and to complete the analysis, remediation and validation of vulnerabilities identified by the scan as required by the State Secure Web Application Standards.

Application scanning and remediation must include the following types of scans and activities

- Dynamic Application Security Testing (DAST) - Scanning interactive application for vulnerabilities, analysis, remediation and validation (May include IAST)
- Static Application Security Testing (SAST) - Scanning source code for vulnerabilities, analysis, remediation and validation

Application scanning and remediation may include the following types of scans and activities as required based on data classification and/or composition

- Software Composition Analysis (SCA) - Third Party and/or Open Source Scanning for vulnerabilities, analysis, remediation and validation
- Native mobile application software scanning (if applicable) including any interaction with an Application Programming Interface (API)
- Penetration Testing - Simulated attack on the application and infrastructure to identify security weaknesses

Infrastructure Scanning

A Contractor providing Hosted Services must scan the infrastructure using an approved scanning tool (Qualys, Tenable, or other PCI Approved Vulnerability Scanning Tool) at least once every 30 days and provide the scan's assessment to the State in a format that can be uploaded by the State and used to track the remediation. Remediation time frame requirements are documented in SOM PSP's.

Acceptable Use Policy

To the extent that Contractor has access to the State's computer system, 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 the State's system. The State reserves the right to terminate Contractor's access to the State's system if a violation occurs.

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

Mobile Responsiveness
The Contractor's Solution must utilize responsive design practices to ensure the application is accessible via a mobile device.

Accessibility Requirements.
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 must provide a description of conformance with WCAG 2.0 Level AA specifications by providing a completed PAT for the Solution. If the Solution is comprised of multiple products, a PAT must be provided for each product. In addition to PATs, Contractors may include a verification of conformance certified by an industry-recognized third-party. If the Contractor is including any third-party products in the Solution, Contractor must obtain and provide the third-party PATs as well.

Each PAT must state exactly how the product meets the specifications. All "Not Applicable" (N/A) responses must be fully explained. Contractor must address each standard individually and with specificity; and clarify whether conformance is achieved throughout the entire product (for example - user functionality, administrator functionality, and reporting), or only in limited areas. A description of the evaluation methods used to support WCAG 2.0 Level AA conformance claims, including, if applicable, any third-party testing, must be provided. For each product that does not fully conform to WCAG 2.0 Level AA, Contractor must provide detailed information regarding the plans to achieve conformance, including timelines.

6. USER TYPE AND CAPACITY

Type of User	Access Type	Number of Users	Number of Concurrent Users
State Employees	Admin Access	10	4
State Employees	Write Access	200	40
Trusted Third Parties	Write Access	250	50

Contractor must be able to meet the expected number of concurrent Users.

7. 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 (http://www.michigan.gov/dtmb/0,5552,7-150-56345_56351_69611-336646--,00.html), which consist of:

1. MILogin/Michigan Identity, Credential, and Access Management (MICAM)
    a. 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.

2. MILogin Identity Federation
    a. Allows federated single sign-on (SSO) for business partners, as well as citizen-based applications.
3. MILogin Multi Factor Authentication (MFA, based on system data classification requirements)
    a. Required for those applications where data classification is Confidential and Restricted as defined by the 1340.00 Michigan Information Technology Information Security standard (i.e. the proposed solution must comply with PHI, PCI, CJIS, IRS, and other standards).
4. MILogin Identity Proofing Services (based on system data classification requirements)
    a. 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 HTTP(s) Headers based SSO, or SAML, or LDAP, or OAuth or OpenID interfaces for the SSO purposes.

8. SECURITY

- Externally hosted systems must provide a GovCloud Solution in a Federal Risk and Authorization Management Program (FedRAMP) authorized computing environment.
- Data must be encrypted in transit and at rest using AES with 256 bit or higher keys and Federal Information Processing Standard (FIPS) validated encryption modules.
- Must support the use of FIPS/National Institute of Standards and Technology (NIST) compliant multi-factor authentication for privileged/administrative and other identified access., The use of restricted methods such as SMMS text with passcode, phone call with temporary passcode or some other approved multi-factor methods may be appropriate based on data classification and level of access.
- Must supply a solution capable of remaining compliant with the Federal Information Security Modernization Act (FISMA) and the NIST Special Publication 800-53 (most recent version) MOD controls using minimum control values as established in the applicable SOM PSP's.
- Must supply a solution capable of remaining compliant with all applicable regulatory and industry requirements (such as HIPAA).
- If requested, provide detailed information on the contents of all required communications that the solution originates to non-SOM IT systems.
- Prohibit the use of any remote access or remote controls functionality not originated by the SOM.
- Provide the SOM a detailed listing of all open-source and third party software included as part of the solution including updated documentation when such content is altered.

On-Premise

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 State Data; and (e) ensure that all Contractor and subcontractor(s) personnel comply with all of the foregoing. 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 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.htm.

9. END USER OPERATING ENVIRONMENT

The SOM environment is X86 VMware, IBM Power VM and Oracle VM, with supporting enterprise storage monitoring and management.

Development teams 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 site traffic, measured using Sessions or Visitors (or)
• The current browser identified and approved as the State of Michigan standard

This information can be found at www.michigan.gov/browserstats. Please use the most recent calendar quarter to determine browser statistics. For those 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.

10. SOFTWARE
Contractor must include a License Agreement for the Solution. The License Agreement should only include licensing terms and should not include any terms that conflict with the **COTS Contract Terms** (e.g. payment terms). Contractor's License Agreement should include full use of the Solution by the State's Authorized Users, and there should not be any separate end-user license agreement required.

For third-party products that are being proposed as part of the overall Solution, Contractor must include any end-user license agreements that will be required to access and use such products.

11. SOLUTION REQUIREMENTS
Contract must detail any configuration changes or customization modifications that will need to be made to the Solution to meet the specifications set forth in **Exhibit A - Table 1 Business Specification Worksheet**.

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 modifications 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 configurations or customizations 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.

12. INTEGRATION
There are no integration services needed at this time, however the State may need integration services in the future.

13. TESTING SERVICES AND ACCEPTANCE
Contractor must review **Section 11. Pre-Delivery Testing and Section 12. Acceptance Testing**, **of the COTS Contract Terms**.

14. TRAINING SERVICES
The contractor must provide administration and end-user training for implementation, go-live support, and transition to customer self-sufficiency. The contractor must provide available training options and include details such as: typical class size, materials to be provided, class duration, on-site or web based. The contractor must provide a training plan for go-live support and transition to self-support, including options

and details such as the number of dedicated personnel, staff location, hours available and duration of go-live support.

Contractor must provide details on, and examples of, clearly written instructions and documentation to enable State administrators and end-users to successfully operate the Solution without needing to bring in additional Contractor support.

15. HOSTING

On-Premise

The State will be hosting the Solution in its own environment, please refer to **Section 11, Operating Environment**, of this Project Scope document.

16. SUPPORT AND OPERATIONS

Support-Hours

The State requires the Contractor to provide Support Hours as 8 a.m. to 5 p.m. Eastern, Monday thru Friday.

On-Premise

Contractor must review the State's Maintenance and Support schedule attached as Schedule E to the COTS Terms and Conditions.

17. DOCUMENTATION

Contractor must provide 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.

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.

18. TRANSITION SERVICES

Upon termination or expiration of the agreement, Contractor must, for a period of time specified by the State (not to exceed 90 calendar days), provide all reasonable transition assistance requested by the State, to allow for the expired or terminated portion of the agreement 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: (a) continuing to perform the services at the established rates; (b) taking all reasonable and necessary measures to transition performance of the work, including all applicable services to the State or the State's designee; (c) taking all necessary and appropriate steps, or such other action as the State may direct, to preserve, maintain, protect, or return (in a format specified by the State) to the State all data stored in the solution; and (d) preparing an accurate accounting from which the State and Contractor may reconcile all outstanding accounts.

19. PRODUCTS AND SERVICES

Contractor must describe additional Solution functionality, products or services that the State specifications do not address but are necessary to implement and support this solution.

20. CONTRACTOR KEY PERSONNEL

Contractor must identify all Contractor resources and responsibilities required for the successful implementation and ongoing support of the Solution.

Contractor Contract Administrator. Contractor must identify the individual appointed by it to (a) administer the terms of this Contract, and (b) approve and execute any Change Notices under this Contract.

Contractor
Name: Sheila Steffenson **Address: 8614 Westwood Center Dr., Suite 450, Vienna, VA 22182** **Phone: 703-444-9488** **Email: Sheila.steffenson@1spatial.com**

Contractor Project Manager. Contractor must identify the Contractor Project Manager who will 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.

Contractor
Name: James Blacker **Address: 8614 Westwood Center Dr., Suite 450, Vienna, VA 22182** **Phone: 703-444-9488** **Email: james.blacker@1spatial.com**

Contractor Service Manager. Contractor to provide name of individual to serve as primary contact with respect to the Services, who will have the authority to act on behalf of Contractor in matters pertaining to the receipt and processing of Support Requests and the Support Services.

Contractor
Name: Michael Martin **Address: 8614 Westwood Center Dr., Suite 450, Vienna, VA 22182** **Phone: 703-444-9488** **Email: Michael.martin@1spatial.com**

21. CONTRACTOR PERSONNEL REQUIREMENTS

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.

22. 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 Project Manager. The State Project Manager will serve as the primary contact with regard to implementation Services who will have the authority to act on behalf of the State in approving Deliverables, and day to day activities.

Agency Business Owner. The Agency Business Owner will serve as the primary contact for the business area with regard to business advisement who will have the authority to act on behalf of the State in matters pertaining to the business Specifications.

State Technical Lead. The State Technical Lead will serve as the primary contact with regard to implementation technical advisement.

Contractor must identify all State resources and responsibilities required for the successful implementation and ongoing support of the Solution.

23. MEETINGS

The resulting awarded contractor must attend the following meetings at no additional cost to the State.

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..

24. 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 percentage of completion for the past week by milestone for projects that are firm fixed price. Or the number of hours expended during the past week, and the cumulative total to date, for projects that are based on time and materials. 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.

If required by any grant funding, all Contractors must submit and enter weekly timesheets intonecessary format to fulfill grant reporting requirements. . The weekly timesheet will contain hours worked for assigned project tasks.

25. MILESTONES AND DELIVERABLES

The State's proposed milestone schedule and associated deliverables are set forth below.

SERVICES MILESTONES AND DELIVERABLES:

Milestone	Phase	Deliverable	Description	Estimate Delivery	Price
1	Implementing 1Integrate Enterprise	Kickoff	Initial Phase Kickoff Meeting	June 22, 2020	$6,381
1	Implementing 1Integrate Enterprise	Training	1Integrate Introductory Training	June 29, 2020	$13,500
1	Implementing 1Integrate Enterprise	MGF Validation	MGF Validation Ruleset delivered to Michigan for UAT	June 26 2020	$34,482
1	Implementing 1Integrate Enterprise	MGF Validation	MGF Validation Rulesets tested and accepted by Michigan	July 17 2020	$34,483
2	Implementing 1Integrate Enterprise	Ultra-Priority Layer XML Rulesets	Ultra-Priority Boundary tested and delivered to Michigan	Jul 30 2020	$13,937
2	Implementing 1Integrate Enterprise	Ultra-Priority Layer XML Rulesets	Ultra-Priority Boundary tested and accepted by Michigan	Aug 15 2020	$13,937
2	Implementing 1Integrate Enterprise	Ultra-Priority Layer XML Rulesets	Ultra-Priority MDOT tested and delivered Michigan	Aug 15 2020	$13,937
2	Implementing 1Integrate Enterprise	Ultra-Priority Layer XML Rulesets	Ultra-Priority MDOT tested and accepted by Michigan	Aug 30 2020	$13,937
2	Implementing 1Integrate Enterprise	Ultra-Priority Layer XML Rulesets	Ultra-Priority Local Road tested and delivered to Michigan	Aug 30 2020	$13,937

2	Implementing 1Integrate Enterprise	Ultra-Priority Layer XML Rulesets	Ultra-Priority Local Road tested and accepted by Michigan	Sept 15 2020	$13,937
3	Implementing 1Integrate Enterprise	Super Priority Layer XML Rulesets	Super Priority Rulesets tested and delivered to Michigan	Sept 1 2020	$27,874
3	Implementing 1Integrate Enterprise	Super Priority Layer XML Rulesets	Super Priority Rulesets tested and accepted by Michigan	Sept 18 2020	$27,874
4	Implementing 1Integrate Enterprise	High Priority Layer XML Rulesets	High Priority Rulesets tested and delivered to Michigan	Oct 15 2020	$27,874
5	Implementing 1Integrate Enterprise	High Priority Layer XML Rulesets	High Priority Rulesets tested and accepted by Michigan	Oct 30 2020	$27,874
6	Implementing 1Integrate Enterprise	Low Priority Layer XML Rulesets	Low Priority Rulesets tested and delivered to Michigan	Nov 7 2020	$18,583
7	Implementing 1Integrate Enterprise	Low Priority Layer XML Rulesets	Low Priority Rulesets tested and accepted by Michigan	Nov 25 2020	$18,583
9	Implementing 1Integrate Enterprise	Documentation	Deliver Test Plan Draft	June 15 2020	$27,874
10	Implementing 1Integrate Enterprise	Documentation	Accept Test Plan	June 19 2020	$27,874
11	Implementing 1Integrate Enterprise	Documentation	Deliver Test Cases Draft	June 10 2020	$27,874
12	Implementing 1Integrate Enterprise	Documentation	Accept Test Cases	June 19 2020	$27,874

13	Implementing 1Integrate Enterprise	Documentation	Deliver Help Documentation	June 10 2020	$16,260
14	Implementing 1Integrate Enterprise	Documentation	Accept Help Documentation	June 19 2020	$16,260
	Phase Total				$ 465,146
15	Optimizing for 1Integrate Enterprise	Kickoff	Initial Phase Kickoff Meeting	Jan 18 2021	$6,381
16	Optimizing for 1Integrate Enterprise	XML Rulesets	Updated rules	Jan 18 2021	$139,407
17	Optimizing for 1Integrate Enterprise	Documentation	Performance Improvement Plan	Dec 18 2020	$46,469
18	Optimizing for 1Integrate Enterprise	Documentation	Updated rule management plan, Reset plan	Dec 18 2020	$46,469
19	United States Geological Survey National Hydrography Dataset Rules Integration	XML Ruleset	Deliver NHD Conflation ruleset approved by USGS (no acceptance required)	Nov 1 2020	$4,000.00
	Phase Total				$242,726
20	Optimizing Submission Portal	Kickoff	Initial Phase Kickoff Meeting	Jan 18 2021	$6,381
21	Optimizing Submission Portal	Configuration	Accept Updated Workflow	Feb 2 2021	$143,148
22	Optimizing Submission Portal	Documentation	Updated user registration and onboarding documents	Feb 2 2021	$143,147
23	Optimizing Submission Portal	Training	Training Session	Mar 12 2021	$13,500

	Phase Total				$306,176
24	Optimizing Database	Kickoff	Initial Phase Kickoff Meeting	Mar 15 2021	$6,381
25	Optimizing Database	Documentation	Draft requirements for database build	Apr 7 2021	$49,842
26	Optimizing Database	Documentation	Draft requirements for workflow software implementation	Apr 23 2021	$49,842
27	Optimizing Database	Documentation	Accept Final requirements for database build	May 3 2021	$49,842
28	Optimizing Database	Documentation	Accept Final requirements for workflow software implementation	May 3 2021	$49,842
	Phase Total				$205,749
29	NG911	Kickoff	Initial Phase Kickoff Meeting	July 30 2020	$6,381
30	NG911	XML Rulesets	Deliver Change Detection	July 30 2020	$49,260
31	NG911	XML Rulesets	Change Detection Accepted	Aug 14 2020	$49,260
32	NG911	XML Rulesets	Deliver Essential Geometry	Sep 20 2020	$47,364
33	NG911	XML Rulesets	Accept Essential Geometry	Oct 11 2020	$47,364
34	NG911	XML Rulesets	Deliver Cross Feature Validations	Oct 15 2020	$23,682
35	NG911	XML Rulesets	Accept Cross Feature Validations	Nov 1 2020	$23,682
36	NG 911	Documentation	Accept Updated Training Documents	Nov 15 2020	$15,788
37	NG 911	Training		Nov 30 2020	$13,500
	Phase Total				$276,281
		Total:			**$**1,496,078

SOFTWARE DELIVERABLES:

1Spatial will license the products listed in the tables below to the State as a part of the 1Integrate Enterprise migration effort. The quantities are estimates and are based on the Service Level Agreement requirements and the expected increase of utilization of the MGF over time. The DTMB program manager will review and provide final counts needed for software licenses by October 1 of each year. The State will only be invoiced for licenses utilized and approved by the DTMB program manager. In the initial phase (through December 31, 2020), it is agreed that the 1Integrate Enterprise licensing costs will be waived in lieu of the previous payment for the 1Integrate for ArcGIS license renewal made by the State in 2020 ($81,000). Fees in 2020 will only be charged for the new components (as shown in the table entitled "Licensing 2020" below). Beginning January 1, 2021, the license fees for the 1integrate software (and other 1Spatial products) will be as outlined below with a 25% discount off the list price based on the volume of the licenses. This percentage discount will continue through each of the 4 additional base years. During the 5 base years, 3rd party products required for the implementation are offered at list price (also in the tables below by year). Through the option years, the prices reflect the 25% discount with a 1.5% uplift year over year.

Software Licensing 2020				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	1	44,200.00	0.00*	0.00*
1Integrate Production - Additional engine	3	22,200.00	0.00*	0.00*
1Integrate Non-Production - Base plus one engine	2	22,100.00	0.00*	0.00*
1Integrate Non-Production - Additional engine	2	11,100.00	0.00*	0.00*
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,100.00	0.00*	0.00*
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	0.00*	0.00*
1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	25,900.00	12,950.00
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	12,950.00	12,950.00
FME - ESRI Edition	4	3,350.00	3,350.00	13,400.00
Total 2020				**39,300.00**

*$81,000 license fee for 1Integrate for ArcGIS to be applied for 2020 1Integrate Enterprise license fees

Software Licensing 2021				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	1	44,200.00	30,940.00	30,940.00
1Integrate Production - Additional engine	3	22,100.00	15,470.00	46,410.00
1Integrate Non-Production - Base plus one engine	2	22,100.00	15,470.00	30,940.00

1Integrate Non-Production - Additional engine	2	11,050.00	7,735.00	15,470.00
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	17,500.00	17,500.00
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	1,750.00	3,500.00
1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	25,900.00	25,900.00
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	12,950.00	25,900.00
FME - Database Edition	3	6,300.00	6,300.00	18,900.00
Total 2021				**215,460.00**

Software Licensing 2022				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	1	44,200.00	33,150.00	33,150.00
1Integrate Production - Additional engine	4	22,100.00	16,575.00	66,300.00
1Integrate Non-Production - Base plus one engine	2	22,100.00	16,575.00	33,150.00
1Integrate Non-Production - Additional engine	2	11,050.00	8,287.50	16,575.00
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	18,750.00	18,750.00
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	1,875.00	3,750.00
1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	27,750.00	27,750.00
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	13,875.00	27,750.00
FME - Database Edition	4	6,300.00	6,300.00	25,200.00
Total 2022				**252,375.00**

Software Licensing 2023

Product	Qty	SLP US$	ASP US$	Total Price to MI
1Integrate Production - Base plus one engine	2	44,200.00	33,150.00	66,300.00
1Integrate Production - Additional engine	5	22,100.00	16,575.00	82,875.00
1Integrate Non-Production - Base plus one engine	2	22,100.00	16,575.00	33,150.00
1Integrate Non-Production - Additional engine	2	11,050.00	8,287.50	16,575.00
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	18,750.00	18,750.00
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	1,875.00	3,750.00
1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	27,750.00	27,750.00
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	13,875.00	27,750.00
FME - Database Edition	4	6,300.00	6,300.00	25,200.00
Total 2023				**302,100.00**

Software Licensing 2024				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	2	44,200.00	35,360.00	70,720.00
1Integrate Production - Additional engine	6	22,100.00	17,680.00	106,080.00
1Integrate Non-Production - Base plus one engine	2	22,100.00	17,680.00	35,360.00
1Integrate Non-Production - Additional engine	2	11,050.00	8,840.00	17,680.00
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	20,000.00	20,000.00
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	2,000.00	4,000.00

1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	29,600.00	29,600.00
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	14,800.00	29,600.00
FME - Database Edition	4	6,300.00	6,300.00	25,200.00
Total 2024				**338,240.00**

Software Licensing Option Year 1				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	2	44,200.00	35,890.40	71,780.80
1Integrate Production - Additional engine	6	22,100.00	17,945.20	107,671.20
1Integrate Non-Production - Base plus one engine	2	22,100.00	17,945.20	35,890.40
1Integrate Non-Production - Additional engine	2	11,050.00	8,972.60	17,945.20
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	20,300.00	20,300.00
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	2,030.00	4,060.00
1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	30,044.00	30,044.00
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	15,022.00	30,044.00
FME - Database Edition	4	6,300.00	6,394.50	25,578.00
Total Option Year 1				**343,313.60**

Software Licensing Option Year 2				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	2	44,200.00	36,428.76	72,857.51
1Integrate Production - Additional engine	6	22,100.00	18,214.38	109,286.27
1Integrate Non-Production - Base plus one engine	2	22,100.00	18,214.38	36,428.76
1Integrate Non-Production - Additional engine	2	11,050.00	9,107.19	18,214.38
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	20,604.50	20,604.50
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	2,060.45	4,120.90

1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	30,494.66	30,494.66
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	15,247.33	30,494.66
FME - Database Edition	4	6,300.00	6,490.42	25,961.67

Total Option Year 2 **348,463.30**

Software Licensing Option Year 3				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	2	44,200.00	36,975.19	73,950.37
1Integrate Production - Additional engine	6	22,100.00	18,487.59	110,925.56
1Integrate Non-Production - Base plus one engine	2	22,100.00	18,487.59	36,975.19
1Integrate Non-Production - Additional engine	2	11,050.00	9,243.80	18,487.59
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	20,913.57	20,913.57
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	2,091.36	4,182.71
1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	30,952.08	30,952.08
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	15,476.04	30,952.08
FME - Database Edition	4	6,300.00	6,587.77	26,351.10

Total Option Year 3 **353,690.25**

Software Licensing Option Year 4				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	2	44,200.00	37,529.82	75,059.63
1Integrate Production - Additional engine	6	22,100.00	18,764.91	112,589.45
1Integrate Non-Production - Base plus one engine	2	22,100.00	18,764.91	37,529.82
1Integrate Non-Production - Additional engine	2	11,050.00	9,382.45	18,764.91
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	21,227.27	21,227.27
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	2,122.73	4,245.45
1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	31,416.36	31,416.36
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	15,708.18	31,416.36
FME - Database Edition	4	6,300.00	6,686.59	26,746.36

Total Option Year 4 **358,995.61**

Software Licensing Option Year 5				
Product	**Qty**	**SLP US$**	**ASP US$**	**Total Price to MI**
1Integrate Production - Base plus one engine	2	44,200.00	38,092.76	76,185.52
1Integrate Production - Additional engine	6	22,100.00	19,046.38	114,278.29
1Integrate Non-Production - Base plus one engine	2	22,100.00	19,046.38	38,092.76
1Integrate Non-Production - Additional engine	2	11,050.00	9,523.19	19,046.38
1Integrate for ArcGIS Production - Desktop Edition 5 named users	1	25,000.00	21,545.68	21,545.68
1Integrate for ArcGIS Non-Production - Desktop Edition Non-Production 1 named users	2	2,500.00	2,154.57	4,309.14
1DataGateway Production - Add-on to 1Int, on premise	1	37,000.00	31,887.61	31,887.61
1DataGateway Non-Production - Add-on to 1Int, on premise	2	18,500.00	15,943.80	31,887.61
FME - Database Edition	4	6,300.00	6,786.89	27,147.56
Total Option Year 5				**364,380.54**

Contractor must provide a Work Breakdown Structure (WBS) that corresponds with the milestone dates set forth above (or with contractor's alternatively proposed schedule). The WBS must be detailed enough to identify all State and Contractor responsibilities.

The Contractor Project Manager will be responsible for maintaining an MS 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 should 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.

26. PRICING

If Contractor reduces its prices 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.

27. ADDITONAL INFORMATION

The State reserves the right to purchase any additional services or products from the Contractor during the duration of the Contract.

STATE OF MICHIGAN

Contract No. 200000000971
Geospatial Data Integration

EXHIBIT A – Table 1
BUSINESS SPECIFICATION WORKSHEET

Detailed Functional Requirements:
Note: The Business Specification Number will be populated inside the test plan

Business Specification
The following requirements that were completed on the previous phase need to be migrated to the new 1Integrate Enterprise platform and re-tested
R&H Rules – Roads Left/Right Low Address Ranges Business Rule
Finds all BPTs that occur only once indicating the road starts without being connected to an end (EPT) and then uses that lines start point node to search within a 3 meter buffer for any potential intersecting roads. The distance property shows how close to another road the Start Point is. Zero means an intersection should likely have occurred
Finds all road features where the BPT value is not in the Intersection Nodes
Compares the Intersection Node that has the BPT value to the start of the road to see if they are the same/within 1 mm
Finds all Roads where the BPT or EPT value is null
Finds all Roads where the ObjectID occurs twice
Finds all EPTs that occur only once indicating the road ends without being connected to an start (BPT) and then uses that lines end point node to search within a 3 meter buffer for any potential intersecting roads. The

distance property shows how close to another road the End Point is. Zero means an intersection should likely have occurred
Compares the Intersection Node that has the EPT value to the end of the road to see if they are the same/within 1 mm
Finds all road features where the EPT value is not in the Intersection Nodes
Finds features where the county left or right is not populated or both are zero
Finds any MGF Roads with no Feature ID
Finds features where minor civil division left or right is not populated or both are zero
Finds all MGF PRs where the BMP is not zero
Finds any Road records where the Shape length is less than 5 feet
Address ranges are contiguous from segment to segment
Left right polygon data is populated correctly
MDOT LRS attributes are populated correctly
Local attributes are populated correctly
Model road intersection Geodatabase feature class from the existing MGF feature layer
Road segment must have road name value in primary road name field
Model comprehensive Geodatabase feature class for Railroads with attributes and domains to store standardized information from multiple Railroad features available from various agencies such as MDOT and Private railroads
Roads are segmented at the intersection of a County Boundary, intersection with other roads, rail, and hydrology. This rule checks a State or Local-

maintained Road geometry is completely contained by a single County or is contained by the boundary of exactly two County geometries
A road junction/intersection contains at most 2 roads with the same name and type. There will be valid exceptions to this rule, as such this rule will be a warning and can have an exception added for individual cases (using the report and exception flag). Locations with an exception will not be reported by the rule
An intersection point must touch at least one road and one of the following road, rail, hydrology. The other type of intersections are road/rail, road/hydro, and hydro/hydro
Perform automated change detection of contributor upload data against corresponding MGF data using rules.
Configure a workflow for DOT Event editing. Discuss with DOT event editing team for the workflow details
Rule: Road must touch at least one other road
Rule: Roads network is void overshoots and undershoots
Rule: State and Local Roads contained by a County
Rule: State and Local Roads Left/Right County attribute match containing County
Rule: Forest and Park Roads contained by a Forest or Park Boundary
Rule: Roads meet at Intersections
Rule: Roads adhere to a link-node standard
Rule: Road network is void of bifurcations
Rule: Road Address ranges are continuous and don't overlap
Rule: Limited access Road Has bridge at intersection of non-Ramp Road

Rule: Intersections are at least 5.1 meters apart
Rule: Intersections represent Road Junctions
Rule: Intersections at grade separations
Rule: Intersections touching Railway require NI attribute
Rule: Intersections with NI attribute require intersecting Rail
Rule: Interchange points must be within 20 meters of a ramp
Rule: Railway line touches at least one other Railway line
Rule: Speed limit over 55 requires pavement Surface Type
Rule: Self-Intersections
Rule: Spikes
Rule: Kickbacks
Rule: Duplicate Points
Rule: Identify Overlaps
Rule: Identify Overshoots and Undershoots
Rule: Duplicate Features
Rule: Single Part Geometries
Rule: OGC Simple
Rule: Identify Slivers
Rule: Identify Insignificant Length Segments
Rule: Geometries must be contained within Michigan Shoreline
Rule: Geometries must be contained within Michigan Political Boundary

Rule: Road Address Ranges have consistent parity
Rule: Road must have valid Type
Configure one generic workflow that can be used for contributors to contribute any of the 40 layers to MGF using a Workflow Manager server configuration. The workflow will be available in the ArcGIS portal as a webpage to run. The user will access the webpage and run the create job step in the workflow, which will create a new job, notify DTMB, then allow to attach data file in ZIP file format. The file will be stored in the Workflow manager geodatabase as a Blob for that Job ID. The further step will download this data file, unzip and store in a file folder for remaining steps to use. Once the data stored in a file folder, the data upload, data validation, change detection, reconciliation and data submission step will be followed. Refer section 4.1.2.2 and Figure 4 for details.
Railroad
Intersections
Rule: Parcel is contained within a county
Rule: Address point inside reference PSAP
Rule: Address point inside reference Municipality
Rule: Address point has valid type
Rule: Address number is populated
Rule: Address on the correct side of the road
Rule: Address Street Entrance on the correct road
Rule: Address Roof Top contained within a Tax Parcel
Address Pts should have a road name value in primary road name field
Rule: Cities do not overlap Village

Rule: Cities do not overlap Census Designated Places
Rule: Cities do not overlap Township
Rule: City references the Census Block with the majority overlap
CDPs are treated exactly as villages and cannot overlap a Village or a City
CDPs are treated exactly as villages and cannot overlap a Village or a City
Model Geodatabase feature class with attributes and domains to store standardized information for MGF
Rule: Townships touch or are contained by County polygons
Village Polygons – Model Geodatabase feature class with attributes and domains to store standardized information for MGF. Use the existing features as a base for the data model
CDPs are treated exactly as villages and cannot overlap a Village or a City
Rule: Villages do not overlap Cities
Rule: Villages completely covered by townships
Rule: Village does not overlap Census Designated Place
Rule: Village references the Census Block with the majority overlap
Rule: Village completely covered by townships
Rule: County completely cover State
Rule: School Districts completely cover State
Rule: Intermediate School Districts completely cover State
Rule: City & Township completely cover State
Rule: Voter Precinct completely cover State

Rule: PSAP completely cover State
Rule: State House Polygons completely cover State
Rule: State Senate Polygons completely cover State
Rule: US House Polygons completely cover State
Rule: School District is completely contained by a single Intermediate School District
Rule: Intermediate School Districts are completely covered by School Districts
Rule: Intermediate School Districts only boarders or contains School Districts
Rule: Intermediate School Districts contains at least 2 School Districts
PA 425 Zone Polygons - Model Geodatabase feature class with attributes and domains to store standardized information for MGF. Use the existing features as a base for the data model
Any 425s with the same Job Number cannot be associated with more than one village, TWP or City
Rule: 425 Zones must be contained within a MCD
State House Polygons - Model Geodatabase feature class with attributes and domains to store standardized information for MGF
The boundary of the State House geometry should follow minor civil division. This rule will check that the boundary of the State House geometry is completely covered by the boundary of minor civil divisions
State Senate Polygons - Model Geodatabase feature class with attributes and domains to store standardized information for MGF. Use the existing features as a base for the data model

The boundary of the State Senate geometry should follow minor civil division. This rule will check that the boundary of the State Senate geometry is completely covered by the boundary of minor civil divisions
US House District Polygons- Model Geodatabase feature class with attributes and domains to store standardized information for MGF. Use the existing features as a base for the data model
Rule: Road must touch at least one other road
Rule: Roads network is void overshoots and undershoots
Rule: State and Local Roads contained by a County
Rule: State and Local Roads Left/Right County attribute match containing County
Rule: Forest and Park Roads contained by a Forest or Park Boundary
Rule: Roads meet at Intersections
Rule: Roads adhere to a link-node standard
Rule: Road network is void of bifurcations
Rule: Road Address ranges are continuous and don't overlap
Rule: Limited access Road Has bridge at intersection of non-Ramp Road
Rule: Road Address Ranges have consistent parity
Rule: Road must have valid Type
Value in Left and Right Low Address Ranges should not be greater than Left and Right High Address Ranges
Values in Left and Right Address Range fields for all road not classified as limited access should have address ranges or be flagged as warning

Address Ranges should increase from beginning of arc segment to end (i.e. From node to To node)
Road segment must have road name value in primary road name field
State Park Polygons – Model Geodatabase feature class with attributes and domains to store standardized information for MGF. Use data model standards available from Esri and other sources
All State Park geometries should be completely contained within the State geometry
Rule: Census Block completely cover State
Rule: Census Block assigned to MCD with most area overlap
Rule: Census Block assigned Precinct with most area overlap
Rule: Census Block Group is completely contained by a single Census Tract
Rule: Census Designated Place do not overlap Cities
Rule: Census Designated Place do not overlap Village
Rule: Census Designated Place completely covered by townships
Rule: Census Track completely cover State
Rule: Census Tract only boarders or contain Census Block Group
Prosperity Polygon - When all of the Prosperity Polygon geometries contained by the State geometry are merged, the merged geometry equals the State geometry
Prosperity Regions Polygons – Should completely cover state out to nautical international and state boundaries
Each Voter Precinct must be contained within a single MCD (Village, City, Township Must be completely within an MCD OR Village (City or Township, or Village)

Rule: Voter Precinct Polygon contained within a US House polygon
Rule: Voter Precinct Polygon contained within a State Senate polygon
Rule: Voter Precinct Polygon contained within a State House polygon
Rule: Voter Precinct references the Census Block with the majority overlap
Rule: Bridge Centerline is contained within a road or rail
Rule: Hydrography Polygons interact with road network at a structure
Rule: Hydrography line don't overlap Roads
Rule: Hydrography line don't overlap Trail
Rule: Hydrography line don't overlap Rail
Rule: Hydrography interacts with road network at a structure
Rule: Hydrography line has artificial path flag when inside Hydrography polygon
Rule: Hydrography line are connected to another water feature
The following requirements will be completed in this phase of the project and tested through the new 1Integrate Enterprise architecture
MGF R&H MDOT Extraction and Workflow / Local Contributor Workflows / MDOT R&H Contributor Workflow
R&H Rules – R&H Activity Log – Align R&H activity codes within the business rules.
R&H Rules – LRS Mile Points Business Rule
R&H Rules – Left/Right Boundary Business Rule
R&H Rules – Track Deletes Business Rule

R&H Rules – Road Address Name Business Rule
R&H Rules – Modify Local Road Contributor to Compare LRS Attributes if Matching Features have a Null Value Business Rule
Segmentation Rule: MDOT segment having two event segments is split
Segmentation Rule: MGF Centerline Geometry Rules -MDOT ALRS and Events
Segmentation Rule: MGF Centerline Geometry Rules – Segmentation for Multiple Events with small extension on event
Segmentation Rules: MGF Centerline Geometry Rules – Merging centerlines from MDOT ALRS and Local Agency
Segmentation Rule: MDOT ALRS and Local Agency Conflation Scenario : Event Data
Segmentation Rule: MDOT ALRS and Local Agency Model Road Differently
Segmentation Rule: MDOT ALRS and Local Agency Model Local Road Differently
Segmentation Rule: MDOT Route and Event Geometry Differs from Local Agency Representation
Segmentation Rule: Local Agency Adds a Road and MDOT does not include Road in ALRS
Segmentation Rule: MDOT extends PR to Align with Local and MDOT includes Road in ALRS
Segmentation Rule: Local Agency Models Road as Divided and MDOT does not represent local road divide in ALRS
Segmentation Rule: Local Agency and DOT Model Roundabout Geometry Differently
Segmentation Rule: Local Agency and MDOT ALRS Cul-de-sac Models Differ

Segmentation Rule :MDOT retires PR route in ALRS. MGF and local agency Represent Road
Segmentation Rule: MDOT deletes PR route in ALRS. MGF and Local agency represent Road
Segmentation Rule: CSS updates City Boundary in MGF based on an Annexation
Segmentation Rule: Merging attributes from multiple sources
Segmentation Rule: MDOT Reverses a Route in ALRS and MGF Geometry and Address Ranges updated
Finds all road segments where the BMP = EMP and PRNumber is not 0
Finds all road segments where the BMP greater than EMP and PRNumber is not 0
Finds all Roads where the PR and BMP values occur more than once
Finds all Roads where the PR and EMP values occur more than once
Attributes are updated correctly at intersection splits
Intersections touching Railway require NI or Structure attribute, except where this a grade separation and a bridge. SOM doesn't have an NI value for where a rail goes over or under a road
Configure a workflow that orchestrate the conflict resolution identified by the 1Integrate change detection process. The workflow should direct the appropriate agency based on the hierarchical order for the data precedence. Once the data editing completes the change detection process will be run automatically from the main workflow.
Configure a workflow for DOT centerline editing. Discuss with DOT centerline editing team for the workflow details
Rule: Railway line intersects Road at Intersection point with NI

Values in Left and Right Address Range fields for all road not classified as limited access should have address ranges or be flagged as warning
Rule: Road must touch at least one other road
Rule: Roads network is void overshoots and undershoots
Rule: State and Local Roads contained by a County
Rule: State and Local Roads Left/Right County attribute match containing County
Rule: Forest and Park Roads contained by a Forest or Park Boundary
Rule: Roads meet at Intersections
Rule: Roads adhere to a link-node standard
Rule: Road network is void of bifurcations
Rule: Road Address ranges are continuous and don't overlap
Rule: Road Address Ranges have consistent parity
Rule: Road must have valid Type
Values in Left and Right Address Range fields for all road not classified as limited access should have address ranges or be flagged as warning
Road segment must have road name value in primary road name field
Rule: Trail must connect to another trail
Contributors data working independently (not copying from another county)
Document how to add/update/delete events to/from the workflow **1. Create documentation for updating Contributor Layer table**
Validation Improvements

2. Append MGF Update and MGF Validate rules to the end of change detection session and modify them so that the proposal is being updated and validated and the MGF feature is not being updated. A Report feature class, which contains the errors, will be written out. **3. Any proposals with a status of APPLIED will be set back to PROPOSED or REVIEW.**
NG 911 contribution workflow (separate from MGF) (separate option) **1. Configure essential geometry validations (See Appendix A)** **2. Configure NENA attribute validations (See Appendix A)** **3. Author Cross Feature validations (See Appendix A)** **4. Author Vintage Over Vintage change detection** **5. Author proposal application** **6. Document onboarding process**
NHD Conflation (separate option) **1. Configure NHD conflation and update MGF schema to match NHD expected schema** **2. Create documentation for maintainability**
Document plan to migration to SQL Server Spatial from Esri Enterprise Geodatabase
The following requirements are new requirements identified in previous phase that will be completed in this phase of the project and tested through the new 1Integrate Enterprise architecture
Identifies any Road records that violate the mile point chaining principle of first records emp must equal next records bmp
Checks for any Roads where the PRNumber is not 7 characters

Identify all Road records where the PR is 0 while the BMP and/or EMP are greater than 0
Identify all Road records where the PRNumber is not zero that have measures which are invalid BMP is null or 0 or EMP is null or 0
Functionality to Handle Deletes **Identifying where a contributor has removed data. When there is a single contributor for a layer, Change Detection identifies deletes. However, when a layer has multiple contributors (roads) Change Detection is unable to determine if the lack of feature is a delete from the contributor or a piece of data never collected from the contributor. To improve the functionality 1Spatial will implement vintage over vintage change detection. Vintage over vintage compares two different vintages of data from a single contributor. The vintage over vintage rules take advantage of an assumption that the majority of the data will match exactly. Any data which does not have an exact match (unique to vintage 1 or unique to vintage 2) is flagged as a change.**
Ability to assign contributors roles to geometry – Currently we assume that MDOT manages all roads with LRS and some local will manage the street address and 911 attributes. What we need though is the ability to assign local contributors to geometry as well as regions and set their roles for Add, Update and Delete operations. We also need the ability to prioritize these operations for situations where more than one local contributor could provide the same geometry **- Implement Contributor Priority** **1. Assign a rank to contributors – Add field to Contributor Layer Table with rank** **2. Ranks will determine which contributors can make spatial changes and scalar changes**
Install 1DataGateway for MGF Workflow solution
Integrate 1DataGateway with existing workflow software

Create workflow definition for 1DataGateway
Combine Contributor Load and Contributor Validate for 3 contributors
The following are requirements identified for the optional 9-1-1 phase.
Boundary features – implement all 1Spatial attribute checks for required, strongly recommended and highly recommended layers as outlined in the 1Spatial spreadsheet inventory of attribute checks.
Boundary features – implement essential geometry checks such as gap, overlaps, slivers, general editing errors.
Boundary features – implement boundary linework edge matching between boundary types
Boundary features – any state specific boundary rules e.g. geographies that must fit in another geography. These may all have been identified in previous phase.
Point features – implement all 1Spatial attribute checks for required, strongly recommended and highly recommended layers as outlined in the 1Spatial spreadsheet inventory of attribute checks.
Point features – check that there are no point features with the same address attributes within the zip code, scalar comparison
Road features – implement all 1Spatial attribute checks for required, strongly recommended and highly recommended layers as outlined in the 1Spatial spreadsheet inventory of attribute checks.
Road features – implement essential geometry checks for road features such as check for overlaps, duplicates
Road features – check for min length
Road features – check for undershoots and overshoots
Road features – check road is in a network (i.e. touches another road)

Road features – check road is broken at intersections
Road features – Address Numbers are valid (Left From, Left To, Right From, Right To)
Road features - Left/Right Address Range is valid (Left/Right side is either both zeros or both not zeros)
Road features - Left/Right Parity values matches Left/Right Address Range Numbers
Road features - Road Feature's Address Range does not overlap another Road Feature's Address Range • **a scalar comparison**
Road features - Address Range values increase in same direction on both sides (i.e. one side does not increase while the other side decreases). Note: Some anomalies might exist.
Road features - Address Range Numbers do not decrease on both sides. Here, "both sides increasing" is considered good, "both sides decreasing" is considered bad, and, "one side increasing while the other side decreasing" is considered (most likely) bad, but, that case is checked by the previous rule. Note: The customer may not want to use this depending on the requirements of their schema/system.
Boundary features vs road features – road features are broken at Boundary Features
Boundary features vs road features – road feature boundary attributes match that of containing Boundary Feature
Boundary features vs point features – check that point feature is inside one Boundary Feature
Boundary features vs point features – check that the point feature attribute match that of containing boundary feature

Boundary features vs point features – check that there are no point features with the same address attributes within the Boundary Feature. Used for the ESN or PSAP
Points Features vs MSAG/ALI – point feature has a matching record in the MSAG/ALI
Road Features at Intersection Points - Checks Roads with the same name that touch at an intersection. The attributes for a side of a Road are compared to the attributes of a side of the other touching Road. The sides of the roads compared depend on whether the Road geometries start or end at the intersection. • **Parity attributes match across intersection.** • **Address Range Numbers increase or decrease consistently across intersection.** • **Address Range Numbers do not overlap across intersection. Note: Optional, as there is another more inclusive check for overlapping address ranges. However, this might be useful as more specific/superseding error report.** • **Bifurcation: No more than 2 roads with the same name intersect at a point.**
Point features vs road features – point features are associated to nearby road features and classified as left or right of road feature • **All Address Attributes (e.g. StreetName, StreetPreDir, Zip Code) of a Point Feature match the Address Attributes of nearby Road. Note: If the Point Feature's address attributes don't match a nearby road, no association to a road is considered and the following rules are not run on the Point.** • **Point Feature Address Number Parity matches Road Feature for Parity for given side.** • **Point Feature Address Number is within Road Feature Address Range for given side.** • **Point Feature Address Numbers are ordered along Road. (A.K.A. Fishbone)**
Road features vs MSAG table
Address Ranges of road feature match records in MSAG table

Note: The Business Specification Number will be populated inside the test plan.

Detailed Non-Functional Requirements

Note: Metrics on layer timings are calculated utilizing layertimingsheet.xlsx. 1Spatial and the State of Michigan will, as necessary, modify this document as the project progresses. 1Spatial will deliver knowledge transfer to the State on utilization and development of metrics for new layers. 1Spatial will also provide documentation and knowledge transfer that describes how to manually pull information from the 1Integrate system to populate an Excel spreasheet to determine if the system is meeting the features/minute metrics outlined below. The key portions of information will be:

1. number of features loaded
2. time for the 1Integrate session to complete
3. time for the data to load into 1Integrate
4. time for the data to write out of 1Integrate

The Excel spreadsheet will have fields for each of the 5 1Integrate sessions for a workflow,will have the metrics for features/minute processed and will have the formulas to calculate the expected time. This documentation and knowledge transfer will occur prior to the beginning of performance testing.

Business Specification Number	Business Specification
NFR1	The Vendor solution must have 1Integrammte Enterprise implemented as the data integration solution.
NFR2	The Vendor solution must be functional with ESRI ArcGIS Enterprise 10.7.1 version or higher.
NFR3	Solution will perform workflow steps setup in 25 minutes (across existing 5 steps: Contributor Load, Contributor Validate, Change Detection, Update, MGF Validate)
NFR4	1Integrate will read 50,000 features/minute (Open Data tasks)
NFR5	1Integrate will write 1,500 features/minute (Commit or CopyTo tasks)

NFR6	1Integrate will process the following number of features in the workflow rulesets (excluding reading and writing data) Features counts for each workflow step are • Contributor Load – Features Loaded in Open Data Task (features submitted by the contributor) • Contributor Validate – Features Loaded in Open Data Task (features submitted by the contributor) • Change Detection – Features Loaded in Open Data Task (features submitted by the contributor + additional MGF features required) • Update – Proposals Loaded (calculations have assumed 10% change)
NFR7	MDOT 1000 features/minute All features submitted by MDOT are changes (the delta for the time slice) and thus the 10% change isn't used for Update with MDOT. Additionally, MDOT Update will additionally update roads based on LRS Events in addition to the Proposals Loaded. To account for this on the MDOT submission the features will be twice the number of proposals loaded
NFR8	Local Road 1000 features/minute
NFR9	Trail 850 features/minute
NFR10	DNR Forest Roads 850 features/minute
NFR11	Site Address Points, Parcels - 15,000 features/minute
NFR12	Cities, Villages, PA 425, Census Designated Place, PSAP, Watershed Boundary, Emergency Service Zones, Census Tract, Census Block, Voting Precincts 250 features/minute
NFR13	Census Block Group, County, Township, School District, Intermediate School District, State House, State Senate, US Congress, Prosperity Regions 150 features/minute
NFR 14	NHD Line 2,500 features/minute

NFR15	Railroad 2000 features/minute
NFR16	Culverts 2,500 features/minute
NFR17	1Integrate will process 1 submission concurrently for each engine licensed (SOM will license engines as specified in the software license section Year 1 – 4 engines Year 2 – 4 engines Year 3 – 5 engines Year 4 – 7 engines Year 5 (and beyond) – 8 engines
NFR18	1Integrate will ‘queue’ submission requests after all licensed engines are in use.
NFR19	Queued submission will process in the order they were submitted

Once the solution is in production and under the support and maintenance phase, these processing times need to continue to be met during testing of software upgrades or service credits will be applied as outlined in the Maintenance and Support section of the Service Level Agreement of this document.

During implementation and maintenance, all workflows and processing must complete successfully 3 consecutive times in the User Acceptance Testing (UAT) environment and must complete within the expected processing times each time.

STATE OF MICHIGAN

Contract No. 200000000971

Schedule B
Statement OF WORK (SOW)

Michigan Geographic Framework (MGF)

Solution Version 2 Update Project

Statement of Work

Date of issue: 30/04/2020

Version: 1.0

Authorization

Role / Org	Name	Signature	Date
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Distribution

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Executive Summary

1Spatial Inc. (1Spatial) is pleased to submit this proposed Statement of Work (SOW) to Michigan's Department of Technology, Management and Budget (DTMB) Center for Shared Solutions (CSS). CSS manages and maintains the Michigan Geographic Framework (MGF) platform and program. The MGF integrates data from multiple authoritative data sources to then publish out statewide integrated GIS data layers. CSS has managed the MGF for over twenty years and a technology refresh project began in 2017.

The solution implementation has run into delays and performance issues that have resulted in working with the current vendors, ESRI Inc. and 1Spatial, to evaluate the current architecture.

The agreed upon changes required to make the solution fully functional involve moving the architected products to 1Spatial's 1Integrate Enterprise rather than the 1Integrate for ESRI ArcGIS Server version of their software.

Together with 1Spatial's 1DataGateway extension, 1Integrate will provide a more seamless and easier to use solution for data submission, validation, and enhancement. The 1Integrate Enterprise product will provide better performance to align with expectations from the State of Michigan (SOM) and make configuration and maintenance of the solution easier for SOM staff.

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1. Introduction

1Spatial will utilize its Commercial off the Shelf (COTS) product 1Integrate for the process of cleaning the data. 1Integrate stands apart from all other data QA/QC packages for several reasons. 1Integrate is unique in its flexibility and configurability to handle a variety of data challenges such as undershoots, overshoots, gaps, overlaps, attribution errors, alignment issues, etc. 1Integrate's rules-based functionality goes beyond just locating errors as it also allows for actions that can automate repairs and fixups to the data.

1Integrate has been used in the following scenarios:

- **Validation** – rules define how the data should exist. The rules identify any feature that does not conform to the standard.
- **Correction** – rules define how data should be changed to conform to the standard.
- **Integration** – rules define how data sets should be combined to meet the standard including:
    - **Change Detection** – identifying how multiple datasets depict the same location. Changes can be identified between different providers, multiple vintages of the same provider, or multiple vintages from different providers.
    - **Data Integration** – apply changes identified during change detection to update one or more datasets.
    - **Data Fusion** – combining multiple siloed datasets to create a new dataset with information unavailable in an individual silo.
    - **Schema Transformation** – applying rules to transform between schema definitions and identifying what the source doesn't provide but is needed by the target.

Additionally, 1Integrate utilizes our proprietary object-oriented cache which was developed to handle both large volumes of data, complex data models, as well as complex data processing tasks. The object-oriented nature of the cache provides for scalable performance even when the complexity of the rules or actions increases. 1Integrate leverages the object-orientated cache to provide the flexibility to work with a variety of schemas and file types, making 1Integrate client agnostic.

For these reasons, we are unique in the market and are unaware of any other packages that have all these capabilities without the requirement of custom development by a software engineer.

1.1. Project Methodology

1Spatial's projects are implemented using a combination of Rational Unified Process (RUP) concepts and Agile concepts. Microsoft Project will be used to manage this project.

RUP divides the lifecycle of a project into four stages: Inception, Elaboration, Construction, and Transition.

- **Inception** kicks off the project and sets up the management of the project.
- **Elaboration** focuses on building the environment and high-level design.
- **Construction** consists of authoring rules and test cases.
- **Transition** focuses on providing documentation to the customer and turning the project over for the customer ownership.

The agile component will come from biweekly (every other week) sprint meetings and daily standup meetings. Biweekly sprint meetings are held with the customer to review the work completed, review the issues encountered, and plan the priorities of the next sprint. Daily standup meetings are conducted with the customer members who are implementing rules. Daily standups focus on similar topics at a smaller scale.

1.2. Project Definitions, Acronyms, Abbreviations

Term	Definition
Product	A piece of software "off the shelf." It could be a 1Spatial or 3rd party product that customers will buy and use. The license does not include services work, although that is often sold in addition to the product. Examples include: 1Integrate, 1Data Gateway.
Solution	Built or customized for a specific customer's needs, include a combination of products (our own and third party), custom code and services for configuration. The solution may be completely bespoke for a customer or there might be a repeatable core which can be offered to many customers in order to solve a similar challenge.
Rules Engine	Patented rules engine lies at the heart of our approach to spatial data management, ensuring processes are easily automated and repeatable across different technology platforms. This is available in 1Integrate and 1Data Gateway products.
1DataGateway	1Data Gateway provides a web-based portal to a smart, simple, and controlled way to deliver validation rules, corrections and data enhancement processes for your users.
1IFA	1Integrate for ArcGIS is 1Spatial's data validation and management software which provides services to the ESRI ArcGIS platform. 1IFA is available on ArcGIS Server, ArcGIS Desktop and Esri Mobile applications such as Collector and Survey123 for ArcGIS.
1Integrate	1Spatial's premium enterprise solution for automated data validation, cleaning, transformation, and enhancement of your data.
CSS	Michigan Center for Shared Solutions
COTS	Commercial off the shelf
DTMB	Michigan's Department of Technology, Management and Budget
DBA	Database Administrator
IAT	Development environment
LDAP	Lightweight Directory Access Protocol

MGF	Michigan Geographic Framework
NHD	National Hydrography Dataset
RUP	Rational Unified Process
Sprint	Two week set period of time within which specific tasks must be completed.
SOM	State of Michigan
UAT	User Acceptance Testing

2. Project Overview

2.1. Objectives

This project is concerned with two solutions:

1. MGF Update Workflow Solution
2. 911 Workflow Solution

For the MGF Update Workflow Solution, the main objective is to improve the performance, stability, and maintainability of the solution. In addition to improving performance, there is some new functionality required for the solution.

2.1.1. Contributor Priority

SOM would like to configure the solution to control the rank of which contributors can make:

- Spatial changes to the data inside the MGF database
- Scalar (non-spatial) changes the to the MGF Database

2.1.2. Identifying Deletes from a Contributor

Identifying where a contributor has removed data. When there is a single contributor for a layer, Change Detection identifies deletes. However, when a layer has multiple contributors (roads) Change Detection is unable to determine if the lack of feature is a delete from the contributor or a piece of data never collected from the contributor.

To improve the functionality, 1Spatial will implement vintage over vintage change detection. Vintage over vintage compares two different vintages of data from a single contributor. The vintage over vintage rules take advantage of an assumption that the majority of the data will match exactly. Any data which does not have an exact match (unique to vintage 1 or unique to vintage 2) is flagged as a change.

2.1.3. Proposal Validation

The result of Change Detection step is a set of proposed changes to the MGF (Proposals). These proposals have confidence values and a status attribute. This additional function is to add a set of validations to flag Proposals that may cause nonconformities in the MGF Validate step.

This enhancement will require CSS to review proposals and identify situations that would cause undesirable results. Validations will be authored to find situations with a similar pattern and mark the proposals for review.

An additional component of this project is to create a 911 Workflow solution using 1Spatial's 1DataGateway.

2.2. Project Structure

The **MGF Update Workflow Solution** project will be divided into four sequential phases. Each phase will be broadly focused on a means for improving performance within the MGF solution.

Phase 1: Implementing 1Integrate Enterprise

Phase 2: Optimizing for 1Integrate Enterprise

Phase 3: Optimizing the database and Workflow software

Phase 4: Optimizing the submission software

Each of the 4 phases will contain the **RUP** sub phases of **Inception, Elaboration, Construction** and **Transition**. Inside the sub phases, 1Spatial will run agile sprints using 2 week iterations.

The **NG 911 Workflow Solution** project will consist of a single phase which will run concurrently with Phase 1: Implementing 1Integrate Enterprise.

1Spatial expects SOM to:

- Provide Esri Licenses (Desktop 10.7.1, Server 10.7.1, Portal 10.7.1, Workflow Manager 10.7.1, Operation Dashboard)
- Provide Access to data for testing
- Provide Access to DBA
- Participate in biweekly sprints including
    - Database and Workflow design and signoff
    - Test case creation, review, and signoff
    - Testing the rules with and without the workflow and signoff
    - Testing the workflow process and signoff

3. Phase – 1Integrate Enterprise Implementation

In the first phase of the project, 1Spatial will modify the MGF Update Workflow Solution to use 1Integrate Enterprise, replacing 1Integrate For ArcGIS (1IFA). 1IFA Rulesets (See Appendix B) will be refactored and tested to run using 1Integrate. Any changes that are required as a result of testing will focus on rule logic reuse and rule consolidation. This will provide efficiency gains in performance, testing and future maintenance.

New MGF requirements will be implemented during this phase. This will include:

- Spatial Contributor Priority
- Scalar Contributor Priority
- Vintage over Vintage Changes in standard workflows

Automated conflation will not be able to account for every possible situation. The current workflow allows for manual review of proposals. It is expected that 1-2% of the MGF Feature class data that is changed by a submission (based on the applied proposals) will have a non-conformance. These non-conformances are identified during MGF Validate and will need to be addressed by SOM during the Edit step in the workflow.

3.1. Inception

At the outset, 1Spatial will hold a formal remote kickoff meeting and will review with CSS the project objectives and plans.

The Phase 1 Master Project Plan will track activities, task due dates, task completion, task responsibilities, and task schedule. This will inform the weekly status report to the client.

The Installation Plan will describe the plan for the building of:

- The IAT environment.
- Any other client side 1Integrate installations.

The Reset Plan will describe the plan for the backup and restore of the MGF database. This includes resetting the database for testing. The schema management plan of the schema. The Rule Management Plan will include instructions for delivery, backup, and restoration.

During the inception phase, 1Spatial will also install and configure a replica of the target MGF production environment on the vender side. This will include, but is not limited to of:

- Microsoft Server (version expected to be 2016 or 2019)
- Microsoft SQL Server database. The same version currently in use
- ArcGIS technology (version expected to be 10.7.1)
    - Portal for ArcGIS
    - Esri Custom WebApp for data submission

    - ArcGIS Server
    - Esri Enterprise Geodatabase
- The latest version of 1Integrate Enterprise

3.2. Elaboration

During Elaboration, 1Spatial will install 1Integrate Enterprise in the IAT environment perform any extracurricular client side 1Integrate installations and, support the setup of the UAT environment. SOM will have two weeks after the installation on IAT to perform a pretest of the installed software. The Test Plan will be updated as required to reflect the new technologies used, and then submitted to the client for approval.

During elaboration, there will be formal confirmation of the schema and rules that will be used by the solution.

During this stage, it will be necessary to design and plan the migration of 1IFA rules to 1Integrate rules, with a focus on identifying beneficial instances of rule reuse. One example in the current workflow, a road is split by multiple other features (roads, boundaries, railroads, events) and each has a copy of the split logic. Moving forward, this logic can be placed in a template and shared by all features. This work will be performed by senior Rule Authors at 1Spatial.

1Spatial and SOM will finalize the schema requirements and assess the impact of the schema changes to support requirements for spatial priority and scalar priority for contributors. A priority ranking paradigm will be agreed (e.g. 1 is a higher priority than 2, or vice versa).

1Spatial will design the changes needed so that a contributor can submit, and the solution can hold, multiple data vintages.

1Spatial will provide introductory training for 1Integrate. The onsite training will cover 5 days. The first day of training will introduce the 1Integrate interface, creating data stores and sessions, and writing basic rules. The second day of training will cover basic actions, action maps, rules on two classes, and If-Then structure. The third day will focus on multiple existence conditions, For All structure, rule templates, object labels, and built-in functions. The last two days of the training will be structured as workshops that will go through additional examples from the MGF Validation session.

3.3. Construction

1Spatial will refactor the 1Integrate Toolbox Python Scripts to deploy the existing MGF solution via 1Integrate. The interface between the ArcGIS Workflow Manager and the 1Integrate Toolbox will remain the same.

1IFA rulesets, and the rules contained therein, will be migrated to 1Integrate sessions. The validation rulesets will be migrated first. This will be done on a, “per MGF Feature class” basis. Following this, the remaining workflow rulesets will be migrated. This migration will be one on a, “per workflow” basis.

Validation sessions will be created for the 31 feature layers listed in Appendix B. These sessions will implement the MGF Validate process for each feature layer within the solution.1IFA validation rules will be migrated to 1Integrate rules for use inside the validation sessions.

The SOM will be responsible for testing the MGF Validate sessions for acceptance. Acceptance testing will be performed using 1Integrate and the results will be written out to the Report feature class. Testing will be performed outside the solution for multiple reasons:

1. Introduce SOM to the 1Integrate application
2. Provide an efficient way to test individual units by avoiding the longer wait time of the full workflow
3. The workflows will not be yet complete
4. The MGF Validate sessions will be used to test the workflows - see Appendix B for the list of MGF feature layers

1Spatial will migrate the 33 Contributor Layer workflows (listed in Appendix C) from 1IFA rulesets to 1Integrate sessions. For each Contributor Layer, the four 1IFA Rulesets used to implement Contributor Load, Contributor Validate, Change Detection, and MGF Update will be refactored to four 1Integrate sessions. The 1IFA rules used in the 1IFA rulesets will be migrated to 1Integrate rules for use inside the 1Integrate sessions.

1Spatial will transition the 1IFA rules to 1Integrate at the rate of 4 rulesets per person per day.

The State of Michigan will test the Contributor Layer workflows for acceptance.

To better define the State of Michigan's required processing time, specific processing time metrics for Phase 1 for each individual dataset have been developed. These processing times encompass the end-to-end workflow from data upload to MGF Validate for each layer and they are outlined in the tables attached in the acceptance document (supplemental).

MGF Validate will be delivered as the first milestone three weeks after the start of the project. Michigan will be responsible for testing the MGF Validate solution. When a workflow is ready for testing, 1Spatial will deliver a zipped file as specified in the rule delivery plan. The rule descriptions will include the purpose and general logic. A copy of the peer Test Report and unit test cases will be provided for a quality assurance documentation trail. The unit test cases will have input data and expected results that we recommend are used by SOM for testing.

3.3.1. Spatial and Scalar Priority

The State of Michigan will modify the schema of the Contributor Layer table by adding attributes for spatial priority and scalar priority. The State of Michigan will refactor the schema of the MGF feature classes by adding attributes for spatial priority and scalar priority.

1Spatial will refactor the 1Integrate Toolbox Python scripts to read the spatial priority and scalar priority for each contribution. These priority values will be stored on the Session feature.

1Spatial will alter the Contributor Load session/rules to populate the scalar priority and spatial priority on each of the contributor features.

1Spatial will refactor the logic of MGF Update session in each workflow so that existing MGF features are only updated if their priority is matched or superseded by the priority of the contributor feature. The spatial

priority attributes of the contributor feature and the existing MGF feature will be examined in determining if a RESHAPE proposal is to be applied. The scalar priority of the contributor feature and the existing MGF feature will be examined in determining if a SCALAR proposal is to be applied.

3.3.2. Vintage Over Vintage

1Spatial will implement Vintage over Vintage Change Detection for one contributor workflow within the MGF solution. 1Spatial will reuse the rules used in Contributor Load and Change Detection to create Proposals by comparing one contributor vintage to a previous contributor vintage. An add will be identified as a current vintage feature without a spatially matching feature in the previous vintage. A delete will be identified as a previous vintage feature without a spatially matching feature in the current vintage. Scalar changes are identified by finding exact spatial matches but different scalar attribution. Spatial changes are identified by finding features in the current vintage that equivalent to feature in a previous vintage with different spatial representations.

3.3.3. Proposal Validation

1Spatial will implement Proposal Validation for one layer workflow within the MGF solution. 1Spatial will reuse the workflow by appending MGF Update rules and MGF Validate rules to the end of Change Detection session. Therefore, the updates will be applied, and the validations will be run within the Change Detection Session. However, the appended rules will be refactored so that the changes are not committed to the MGF solution. A Report feature class (which contains the validation errors) will be written out. Also, the appended Change Detection session will be modified to reset any Proposals with a status of APPLIED back to REVIEW.

3.4. Transition

1Spatial will support the setup of the Production environment and the migration of rulesets delivered during this phase from UAT into Production.

1Spatial will deliver the following documentation:

1. Contributor Onboarding Guide – A step by step guide for adding contributors for existing workflows. This guide will contain screen shots.
2. 1Integrate Toolbox Guide – A guide for the Python scripts and ArcGIS toolbox tools that are used to facilitate the workflow. This guide will include installation and configuration.
3. 1Integrate Installation Guide
4. 1Integrate Training Guide

After this delivery, the State of Michigan takes responsibility for the control of the master rulesets and maintenance begins.

4. Phase – 911

1Spatial will create contributor workflows for the 911 Data Repository outside of the MGF workflow. These workflows will be created using 1DataGateway and 1Integrate.

4.1. Inception

At the outset, 1Spatial will create several plans to manage various project aspects. The **Phase 911 Project Plan** will track activities, task due dates, task completion, task responsibilities, and task schedule. This will inform the weekly report to the client.

1Spatial will also create an **Installation Plan** for the:

- The 911 IAT environment.
- The 911 UAT environment.

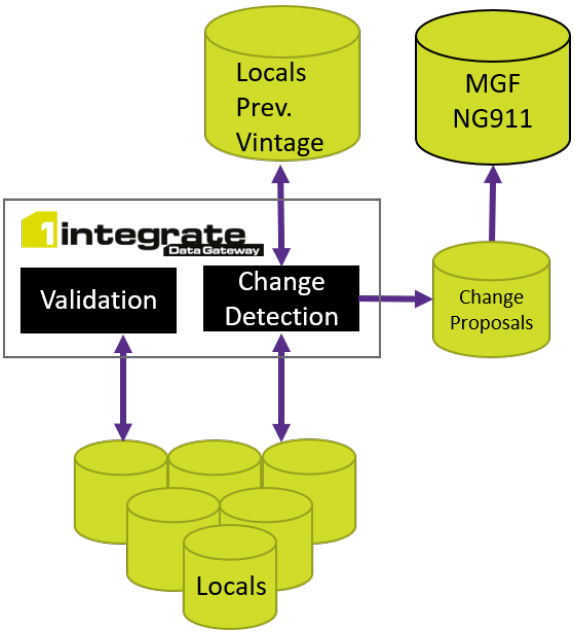
Additionally, 1Spatial will create a **Reset Plan** for the 911 Data Repository. This includes resetting the database for testing. 1Spatial will also create plans for the management of the schema, and for the management of the 1Integrate Rules. The rule management plan will include instructions for delivery, backup, and restoration.

During the inception phase, 1Spatial will also install and configure a replica of the target 911 environment on the vendor side. This will consist of:

- Microsoft SQL Server Spatial database. The same version currently in use.
- The latest version of 1Integrate Enterprise and 1DataGateway.

4.2. Elaboration

During Elaboration, 1Spatial will build the IAT environment, and support the creation of the UAT environment.



During Elaboration, there will be formal confirmation of the 911 schema and the 911 rules. 1Spatial will finalize design for the 911 workflows, including submission, exception handling, and change detection.

To provide contributors control over exceptions, 1Spatial recommends allowing the contributor to upload an exception feature layer. This can be empty, but if populated should have a schema that matches the non-conformance reports provided by 1DataGateway. The exception and report schemas will be part of the final design for approval.

Change detection will leverage Vintage over Vintage methodology.

1Spatial will configure the basic NG 911 attribute validation rules.

1Spatial will test the 1DataGateway Schema Mappings and 1DataGateway validations.

4.3. Construction

1Spatial will build 1DataGateway 911 contributor workflows for the following layers:

- Site Address Point
- PSAP
- Road Centerline
- Emergency Service Zone

These workflow steps will include:

- Data Load – done via 1DataGateway's schema mapping function
- Data Validation – the set of validations to be applied via 1DataGateway

- Change Detection (Vintage over Vintage)
- Update

The validation sessions will include stock essential geometry checks (9), stock NENA 911 attribute validations (276), and 911 business rule validations (20 to be built). All checks are described in Appendix A – 911 Validations.

The State of Michigan will be responsible for testing the 911 workflows for acceptance.

4.4. Transition

1Spatial will provide SOM a 3-day training for the solution contributor onboarding and administration. This training will introduce 1DataGateway, and provide participants an overview of the interface, administration of users and projects, and how to run and review sessions. All participants will need to have completed the 5-day 1Integrate Introductory training as a prerequisite for the 1DataGateway training. These trainings will take place onsite unless, during the ongoing pandemic, we are unable to travel, in which case remote trainings will occur.

1Spatial will provide SOM with the updated documentation for administering the solution and expect SOM to take ownership of the ruleset. NENA Attribute validations are available on GitHub and SOM will have access to the repository.

5. Phase – 1Integrate Optimization

During Phase 1, 1Spatial focused on migrating the functionality of the MGF Update Workflow Solution to leverage 1Integrate Enterprise. While there are some inherit performance gains using the Enterprise product, to meet the performance metrics, 1Spatial will need to leverage additional capabilities inside 1Integrate.

Additionally, 1Spatial is working on a project with the United States Geological Survey (USGS) to conflate National Hydrography Dataset (NHD) updates. 1Spatial will provide NHD Conflation rules from this project done with USGS during this task within this Phase. These rules are important to all stakeholders in the State of Michigan providing data updates to rivers, streams and lakes and making there the integration of those updates include the necessary validations to meet USGS standards. This task will include all the rules developed for USGS to date.

5.1. Inception

At the outset, 1Spatial will create a1Integrate Optimization Master Project Plan that will track activities, task due dates, task completion, task responsibilities, and task schedule. This will inform the weekly report to the client.

The plan will focus on the candidate layers to implement performance improvements after reviewing the performance at the end of Phase 1. This Statement of Work focuses on the following layers based, which have been benchmarked using previous performance experience:

- MDOT Roads
- City
- County
- Township
- Village
- StateHouse
- StateSenate
- USHouseDistrict
- CensusBlockGroup
- SchoolDistrict

1Spatial will update the Reset Plan and Rule Management Plan, if necessary. 1Spatial will use the previous schema management and Rule Delivery Plan.

1Spatial will host a remote workshop to review the existing MGF schema and determine any changes that will be required to utilize the NHD rules. 1Spatial will take the information gathered from this session and generate documentation as part of the elaboration section below.

5.2. Elaboration

During elaboration, there will be formal confirmation of the schema and rules that will be used by the solution. The Test Plan will be updated as required to reflect the new technologies used, and then submitted to the client for approval.

During this stage, it will be necessary to design and plan the implementation of the non-functional requirements that relate to the performance of the solution. The following table provides the recommended strategy, improvement and layers which will be modified.

Strategy	Description	Improvement	Layers
Update Region	Contributor Region- Build a polygon around the submitted data Update Region - Build another polygon around the identified changes	Load Speed (loading fewer features) Validation (only validate features changed)	Contributor Region MDOT Update Region MDOT Road City County Township Village State House State Senate US House District Census Block Group School District MDOT Road
Step Combination	Combine Contributor Load and Contributor Validate workflow steps	Reduces duplicate read	

			City County Township Village State House State Senate US House District Census Block Group School District MDOT Road City County Township Village State House State Senate US House District
Action combination	Combine multiple actions into a single task	Reduces looping over data items multiple times unnecessarily	

			Census Block Group School District
Writing Measure values	1Integrate allows measure values to be written to features (1Integrate for ArcGIS does not)	Reduced processing of MDOT workflow in the following steps: Contributor Load and Change Detection	MDOT

Based on the results of the above tests, 1Spatial will propose a Strategy for performance improvements that will be approved by the State of Michigan before being implemented.

5.3. Construction

The construction subphase will be split into functional groups for implementation.

5.3.1. Update Region

1Spatial will implement its processing region functionality for use in the MGF Update and MGF Validate sessions within the MGF Workflow Solution. These processing regions will be called UPDATE REGIONs and will be used to limit the data loaded during these sessions. This functionality will be implemented for the following contributor workflows and others as required to meet the performance metrics:

- MDOT Roads
- City
- County
- Township
- Village
- StateHouse
- StateSenate
- USHouseDistrict
- CensusBlockGroup
- SchoolDistrict

1Spatial will configure specific workflows to use the processing region functionality.

The 1Integrate Toolbox Python scripts will be refactored to create an UPDATE_REGION feature class for contributor workflows configured to use this functionality.

The 1Integrate Toolbox Python scripts will be refactored to configure 1Integrate Sessions (MGF Update and MGF Validate) for use with the processing regions via the REST API, for contributor workflows configured to use this functionality.

1Spatial will create a new ‘MGF Create Update Region’ process step. This process will be realized by a 1Integrate session called ‘MGF Create Update Region’ and will be used to create the processing regions for use with the MGF Update and MGF Validate sessions. Note: this process is intended to be run after the Proposal Review step.

1Spatial will create a 1Integrate Session called ‘MGF Create Update Region’ that can be used for each of the contributor workflows listed above that will implement this functionality. This may be achieved via one session, or a few sessions.

- The session will load the relevant MGF Feature layer and the Update Proposals for that MGF Feature layer.
- 1Integrate actions will create UPDATE REGION features that represent (in total) the “area of concern” of each of the Proposals that are to be applied.

    - UPDATE REGION features are either:
        - A buffer around the changes for linear and point features.
        - An area geometry of the changes (full geometry for adds, deletes, and scalar changes and the differences between old and new for a reshape).
        - A polygon that contains the changed features such as a County boundary, convex hull, or bounding box data extent.
- UPDATE REGION features will (in total) represent the “area of concern” of both the old feature geometries and any new feature geometries to be applied.
- UPDATE REGION features will be created for SCALAR CHANGE proposals.

5.3.2. Contributor Region

1Spatial will implement processing region functionality for use in the Change Detection and Create Update Region sessions within the MGF Update Workflow Solution. These processing regions shall be called CONTRIBUTOR REGIONs and will be used to limit the data loaded during these sessions. This functionality shall be implemented for the MDOT contributor workflow.

1Spatial will configure the MDOT workflow to use the contributor region functionality. 1Spatial will implement this configuration via the Contributor Layer metadata table.

The 1Integrate Toolbox Python scripts will be reused to create a CONTRIBUTOR_REGION feature class for contributor workflows configured to use this functionality.

The 1Integrate Toolbox Python scripts shall be refactored to configure 1Integrates Sessions (Change Detection and Create Update Region) for use with the processing regions via the REST API, for contributor workflows configured to use this functionality.

1Spatial will modify the MDOT Contributor Load session to create CONTRIBUTOR REGIONs for the MDOT workflow.

- 1Integrate actions will create CONTRIBUTOR REGION features that (in total) represent/include the “area of concern” of each of the Staging features created during the Contributor Load.
- CONTRIBUTOR REGION features are either:
    - A buffer around the contributed features.
    - A polygon that contains the contributed features such as a County boundary, convex hull, or bounding box data extent.

5.3.3. Combining Workflow Steps

1Spatial will combine steps in the existing MGF Workflow to reduce the time required for data loading and process step overhead.

1Spatial will append the rules/actions contained inside the Contributor Validate session to the end of each Contributor Load session. With the Contributor Validate rules appended to the Contributor Load step the Contributor Validate step becomes redundant and will be removed from the MGF Workflow.

1Spatial will combine the functionality of the MGF Update step and the MGF Validate step by appending the rules and actions contained inside the MGF Validate sessions to the end of the MGF Update Sessions.

The MGF Validate step will remain as workflow step that repeats while validation errors exist. The MGF Validate session will remain as standalone session that will be ran outside the workflow.

5.3.4. Rule Optimizations

1Spatial will add a Session feature class for each contributor job. The Session feature class will contain a single record that contains metadata for the job that is like the record in the contribution table. 1Spatial will modify the 1Integrate Toolbox Python scripts to create this feature class. 1Spatial will add this feature class to the 1Integrate sessions so that the metadata for the job is available to the rules and actions.

1Spatial will create an action template that populates metadata attributes on a feature based upon the metadata contained within the Session feature. Templates are actions or rules that can be reused inside other actions and rules. This template will be used inside each Contributor Load session to assign metadata to the staging features. This will improve performance by eliminating the metadata assignments that are currently performed by the Python script after Contributor Load.

1Spatial will add an action template to the end of each MGF Validate session that culls errors of any given type above a maximum limit (e.g. 10,000). This will improve performance by reducing write times for widespread errors (usually encountered during rule writing).

1Spatial will replace the current Road splitting logic contained within the MGF Update session with logic that first creates split points, and then subsequently uses those split points to split Road features and create IntersectionPoint features. This will be accomplished via a split point cache class. This will improve performance by eliminating the need to search for missing IntersectionPoint features.

1Spatial will create an action template to split roads. Templates are actions or rules that can be reused inside other actions and rules. This will improve maintainability by locating all the road splitting logic in one place.

1Spatial will alter the 1IntegrateToolbox Python script to create the staging feature class within the MDOT workflow with M values instead of Z values. 1Spatial will update the rules and actions within the MDOT workflow to reference the M values instead of the Z values. 1Spatial will remove the rules that convert M values to Z values from the rules and actions in the workflow. This will help performance by removing processing rules.

1Spatial will create an action template to create Report features automatically from MGF feature with sensible defaults.

1Spatial will create an action template to Set QC Attributes on feature. The template will only set QC attributes if needed. This will improve performance by removing feature commits.

1Spatial will create rule templates for Road validations in order to make the rules more legible and easier to maintain (e.g. address number is valid, address numbers are valid on side of road, address has range on side of road, address increases on side of road, address is even on side of road, road enters intersection).

1Spatial will create action templates to do validations for roads matched across an intersection (parity matches across intersection, address range matches across intersection, attributes change across intersection).

1Spatial will create rule templates to determine left right attributes for all boundary classes. These will be reused for populating values in Update actions.

1Spatial will create action template to create markups for holes in gap coverage.

1Spatial will add validation rules to make sure more the metadata attributes are populated.

1Spatial will alter script/sessions/rules to create uniform name for Contributor feature classes (e.g. ContributorCity, ContributorTownship). This cannot be done for multi feature class contributions (e.g. The contributor feature classes in the MDOT workflow will remain as “LogEvent” and “LrsnPRMP.”

1Spatial will alter datastores/rules to use uniform names inside rules for cache classes and proposals. For example, the Township rules and the Road rules will both use a feature class named “Proposal” instead of “ProposalStandardRoad” class. This will allow for common rules and templates between workflows.

1Spatial will create the following Proposal action templates:

- to create Rejected Proposals from a Proposal
- to create DELETE Proposal
- to create ADD Proposal
- to create RESHAPE Proposal
- to create MATCH Proposal
- to create SCALAR CHANGE Proposal
- to create UNKNOWN Proposal
- to auto populate confidence values
- to set metadata attributes on created MGF Features
- to set metadata attributes on updated MGF Features

1Spatial will update rules to use built-in functions and/or templates in order to more efficiently copy attributes from one feature to another.

1Spatial will modify the MGF Update sessions of the StandardRoad workflow, the TrailStandardRoad workflow, and the LRSStandardRoad workflow. These MGF Update session will be updated to reuse common rules and actions.

1Spatial will provide documented overview of the latest NHD Conflation rules. This documentation will include:

- Rule Catalog
- The required data format/structure

- Functionality
- Limitations of the project rules
- Specific changes required to the MGF schema to work with the NHD rules.

SOM will be responsible for the implementation of any schema mapping based on 1Spatial's recommendations.

5.4. Transition

1Spatial will deliver:

- Update rules
- Update 1Integrate Toolbox
- Updated documentation

The 90-Day Warranty Services period begins following acceptance of the MGF Solution installed on State of Michigan Production environment. For details of the support levels, error categorization, service credits, please see the (supplemental) service document.

1Spatial will deliver the latest NHD rules as a compressed xml backup file, according to the Rule Delivery Plan.

6. Phase – Optimizing Submission Portal

The MGF Update Workflow Solution currently uses a custom web application and Esri's Portal for ArcGIS to allow contributors to submit data to update the state repository. 1Spatial provides a COTS product 1DataGateway that will be used to replace Esri's Portal for ArcGIS as the data submission portal.

1DataGateway is a COTS product inherently designed to be a submission portal, like what MGF requires, which supports validation and integration submission workflows from statewide contributors. The current web app builder implementation is a custom bespoke solution that will require custom one-off development to get new functionality and enhancements. The 1DataGateway already has a customer base and is actively being developed with new functionality coming in each release.

1DataGateway will allow users to submit files (compressed: ShapeFiles, FileGeodatabase, uncompressed: CSV or CAD files) by dragging and dropping them onto the web interface for automated data validation. The 1DataGateway also enables data suppliers to perform self-service schema mapping. In the current implementation the MGF staff or 1Spatial must build the schema mapping within 1Integrate rules and actions for every supplier that is onboarded. Leveraging 1DataGateway the suppliers can perform and update their schema mapping, offloading the schema mapping maintenance from the MGF staff. For data suppliers not capable of configuring the schema mapping, MGF can perform the initial schema mapping and save it for ongoing submissions. If the schema changes, the supplier will be notified to update the schema mapping. During the upload process, the data providers will see validation results as they are being processed with the ability to leave the application and return to see the current state of data including reviewing the results as they continue to process, see the final completed results or review results from previous submissions. 1DataGateway then allows contributors to download the non-conformance reports as a pdf report, non-spatial tables and a spatial layer pinpointing the non-conformance location. Additionally, 1DataGateway provides an integrated dashboard to view how submissions are doing over time (e.g. is the data improving, declining, or staying the same) by supplier and ruleset.

6.1. Inception

At the outset, 1Spatial will create the Phase 4 Master Project Plan, will track activities, task due dates, task completion, task responsibilities, and task schedule. This will inform the weekly report to the client.

Additionally, 1Spatial will continue to use and extend the existing Reset Plans for the backup and restore, schema management, and rules management.

During the inception phase, 1Spatial will update the replica environment on the vender side plus adding 1DataGateway. This will consist of:

- The latest version of 1DataGateway
- The current version of 1Integrate installed in Development
- The current version of Microsoft SQL Server installed in Development
- The current version of workflow software installed in Development

6.2. Elaboration

During Elaboration, 1Spatial will install 1DataGateway the IAT environment. 1Spatial will support SOM to install 1DataGateway on the UAT environment.

The installation on IAT will include tying 1DataGateway to the LDAP. 1Spatial will support SOM to configure users and groups to 'register' users (for up to 10 users) to use 1DataGateway.

- Update documentation to register a user using 1DataGateway
- Document how to use the basic schema mapping for a Contributor

6.3. Construction

1Spatial will enable 1DataGateway to log a new submission including:

- logging a new job number record
    - with the supplier
    - submission date
- save the data to the local server

1Spatial will configure 1DataGateway to call a projection engine to project data into Michigan GeoRef (EPSG:3078) and create a new Workflow so that it does not call Contributor Load and Contributor Validate. 1DataGateway will run these rule sets. This will enable the original workflows (like MDOT) to continue to run without requiring 1DataGateway

1Spatial will combined Contributor Load and Contributor Validate for the following contributors for 1Integrate (or three contributors of SOM's choosing):

- County (Jackson) Tax Parcels
- (small county) Voting Precincts
- MDOT Culverts

1Spatial will document how to combine Contributor Load and Contributor Validate. 1Spatial will also update the Contribution documentation to describe how to submit data via 1DataGateway including schema mapping.

1Spatial will test contributions for the 3 contributors via 1DataGateway submission portal and test 2 contributor submissions using the previous submission portal if SOM wants to retain it.

6.4. Transition

1Spatial will provide a 1-day training for SOM how to combine Contributor Load and Contributor Validate. 1Spatial will support SOM to install 1DataGateway solution in Production. This 1-day training will specifically cover standardizing schema as part of the Contributor Load as well as running the validation session and reviewing session results within 1DataGateway. Additionally, 1Spatial will provide a 2-hour remote training to SOM and data contributors on how to add data to their projects in 1DataGateway. 1Spatial will provide this remote training twice, and documentation detailing the data contributor process will be provided to SOM to conduct further sessions without 1Spatial.1Spatial expects SOM will migrate or onboard additional contributors to the 1DataGateway solution.

7. Phase - Infrastructure Review

The third phase of the project is concerned with improving the performance of the MGF Update Workflow Solution by optimizing components within the solution other than 1Integrate. Components of the solution will be assessed and candidates for replacement or modification will be identified. Components of the solution will be replaced or modified as needed to hit performance metrics.

7.1. Inception

During Inception, 1Spatial will review, with SOM, the current performance of the MGF Update Workflow. 1Spatial with SOM will identify which components from the list below will be reviewed along with a suggested replacement if known at the time of the document

1. Esri Enterprise Database (replacement Microsoft SQL Server Spatial)
2. Esri Workflow Manager (replacement Microsoft Flow?)

1Spatial will perform an initial performance test using the replica environment hosted by 1Spatial to determine the performance improvement moving from Esri Enterprise Geodatabase to Microsoft SQL Server Spatial (SQL Server native geometry support). The performance test will focus on the speed 1Integrate can read data from and write data to Microsoft SQL Server Spatial.

1Spatial will canvas the available workflow programs and provide SOM a list of 2 potential workflow software options for 1Spatial to investigate. During Elaboration, 1Spatial will compare these to the existing Esri Workflow Manager, totaling three workflow software packages for comparison.

7.2. Elaboration

7.2.1. Database

If SOM determines the performance gains are worth further investigation, 1Spatial will review the downstream implications of migrating off of SDE such as the impact and potential removal and replacement of Workflow Manager, Operations Dashboard, Data Reviewer and publication script workflow.

7.2.2. Workflow

1Spatial will compare and document up to three workflow solutions (Esri's Workflow Manager and the two selected during Inception). 1Spatial will focus on the following aspects when reviewing the candidate workflow solutions:

- Ability to work with 1Integrate Enterprise
- Ability to handle multiple workflows concurrently
- Ability to queue requests
- Ability to restart a workflow instance paused/stopped (voluntarily or due to network outage)
- How the workflow stores job metadata
- How workflows are configured (a user interface, scripts, etc.)
- Licensing models

1Spatial will provide a final document detailing the differences between the candidate workflow software. This report will provide the reasoning behind the selection detailing the benefits of the suggested workflow software, along with risks and assumptions.

7.3. Construction

7.3.1. Database

Based on the implications identified during Elaboration, 1Spatial and SOM will determine if the replacement of Esri's Enterprise Geodatabase with Microsoft's SQL Server Spatial will provide the desired performance improvement and the downstream implications are worth moving forward.

If the decision to move forward is made, 1Spatial will plan a process to migrate the MGF Data from Esri Enterprise Geodatabase into Microsoft SQL Server Spatial database. 1Spatial will document and provide a cost to perform the modifications (described below) to move from the MGF Production database from Esri Enterprise Geodatabase to a Microsoft SQL Server Spatial database.

To migrate to Microsoft SQL Server Spatial, 1Spatial will need to estimate the following steps:

- Update the workflow scripts to create SQL Server Spatial tables (rather than Esri Enterprise tables) for workflow steps (i.e. Job00000_ProposalRoad for a local road contribution).
- Test the workflow scripts ensuring the correct tables are created and populated.
- Upgrade FME from Esri Enterprise to Database Enterprise edition.
- Update the 1Integrate Enterprise Data Stores to reference Microsoft SQL Server.
- Test the connection between 1Integrate and Microsoft SQL Server via FME.
- Update the unit test cases to use SQL Server Spatial.
- Apply the unit test cases to ensure the results match.
- Remove WMX database
- Remove Data Reviewer database.
- Create a report reviewer widget for ArcMap (needs its own requirements).
- Update 1Integrate Toolbox to write reports to SQL Server Spatial database.
- Update the publication scripts to read from SQL Server Spatial database.
- Update or replace Esri Operation Dashboard.

SOM will need to:

- Update test cases (if necessary) to use Microsoft SQL Server.
- Apply the test cases for regression testing.

7.3.2. Workflow

If SOM moves forward with the recommended proposal, 1Spatial will document the required changes to the existing MGF Update Workflow Solution to migrate to the selected workflow software. Changes will include (but not limited to):

1. How jobs are created after submission

2. Updates to the 1Integrate Toolbox
3. How metadata is tracked through the workflow
4. Architectural changes

7.4. Transition

7.4.1. Database

1Spatial will provide a requirements document for the migration to Microsoft SQL Server Spatial.

7.4.2. Workflow

1Spatial will provide a requirements document to implement the selected workflow software.

8. Summary of Requirements

The project requirements have been listed and split into functional and non-functional requirements.

8.1. Summary of Functional Requirements

The functional requirements cover the following themes.

- **Existing** - requirements that were completed on the previous phase which need to be migrated to the new 1Integrate Enterprise platform and re-tested.
- **Outstanding** - requirements will be completed in this phase of the project and tested through the new 1Integrate Enterprise architecture.
- **New** - new requirements identified in previous phase that will be completed in this phase of the project and tested through the new 1Integrate Enterprise architecture or requirements identified for the optional 911 phase.

All details of these requirements are listed in Appendix D - Detailed Functional Requirements.

8.2. Summary of Non-Functional Requirements

The mandatory minimum non-functional requirements are detailed in Appendix E - Non-Functional Requirements.

9. Delivery

All artifacts created during the construction phase will be delivered to SOM.

9.1. Implementation Plan

The implementation plan will be created and agreed as part of the Master Project Plan that is created with each phase of the project.

9.2. Project Deliverables

Phase	No.	Deliverable Name	Deliverable Type
1Integrate Enterprise Implementation	1	1Integrate Enterprise v2.6.2	COTS Software
1Integrate Enterprise Implementation	2	MGF Validation migrated ruleset	xml backup
1Integrate Enterprise Implementation	3	1Integrate Toolbox for 1Integrate Enterprise	Python Delivery
1Integrate Enterprise Implementation	4	City Workflow migrated ruleset	xml backup
1Integrate Enterprise Implementation	5	Software Installation Verification Checklist	Document
1Integrate Enterprise Implementation	6	Migrated Data in State Development Environment Migrated Data	Migrated Data
1Integrate Enterprise Implementation	7	Test Plan	Document
1Integrate Enterprise Implementation	8	Test Specification	Document
1Integrate Enterprise Implementation	9	Test Plan (including Performance Tests)	Document

1Integrate Enterprise Implementation	10	The MGF Solution installed on State of Michigan QA environment	Configured COTS Software
1Integrate Enterprise Implementation	11	The MGF Solution installed on State of Michigan Production environment	Configured COTS Software
Optimizing the submission software.	12	90-Day Warranty Services period begins following acceptance of the MGF Solution installed on State of Michigan Production environment	Warranty
Optimizing the database and Workflow software.	13	User Manual	Document
Optimizing the database and Workflow software.	14	Technical Manuals	Document
Optimizing the submission software	15	Maintenance of Solution software, as described above, available under an annually renewable contract which will commence at the end of the 90-day warranty period	Remote Support
Optimizing the submission software	16	Knowledge transfer to State staff via customized training	Custom Training
Optimizing the submission software	17	Contingency services to meet new requirements Remote Support	Remote Support
Optimizing 1Integrate Enterprise	18	Updated rules	XML backups
Optimizing 1Integrate Enterprise	19	Updated python toolbox	Configured COTS Software

Optimizing 1Integrate Enterprise	20	Performance Improvement Plan	Document
Optimizing 1Integrate Enterprise	21	Updated back ups	XML backups
Optimizing 1Integrate Enterprise	22	Updated Rule Management Plan	Document
Optimizing 1Integrate Enterprise	23	Updated Reset Plan	Document
Optimizing 1Integrate Enterprise	24	Updated UAT Plan	Document
Optimizing Database	25	Updated Workflow Document	Document
Optimizing Database	26	Updated Database Documentation	Document
Optimizing Submission Portal	27	Updated Contribution Documentation	Document
Optimizing Submission Portal	28	Updated Workflow Documentation	Document
Optimizing Submission Portal	29	Updated Submission and Onboarding Documentation	Document
Optimizing Submission Portal	30	1-day onsite training for 1DataGateway, and two 2-hour remote sessions for data contributors	Custom Training

911	31	1DataGateway v2.0.2	COTS Software
911	32	Vintage over Vintage rulesets	XML backup
911	33	Updated Test Specification	Document
911	34	NG911 Validation Rules	XML Back-ups
911	35	Updated Contributor Documentation	Document
911	36	Updated Contributor Onboarding Training	Remote Training
911	37	Updated Admin Guide	Document
911	38	Administrator Training	Remote Training
USGS NHD Rules Integration	39	USGS NHD Rules Document	Document
USGS NHD Rules Integration	40	NHD Rules	XML Back-ups
		Master Plans (one per phase)	Document
		Installation Plan	Document
		Risk Catalog	Document
		Weekly Progress Reports	Document

9.3. Base Years Two through Five Contingency Service Dollars

If during the project additional requirements are identified as necessary for the solution, the SOM, at its discretion, can add hours to the contract up to the total hours listed below. This is estimated hours only and the State is under no obligation to utilize all or any specific portion of these estimated reserve bank of hours/other services, or contingency services during this contract period. Any use of these hours in future years would require a statement of work and change notice to the contract.

Year	Number of Hours	Blended Rate	Total
2021	500	$245	$122,500
2022	1200	$245	$294,000

2023	1000	$245	$245,000
2024	750	$245	$183,750

The blended rate is based on an average of a typical combination of efforts required by the various consultant levels listed in the chart below.

Position	Hourly Rate
Consultant	$180
Senior Consultant	$230
Principal Consultant	$275
Senior Software Engineer	$300
Director of Consultancy	$350

9.4. On-going Project Activities

9.4.1. Project Management

Throughout the project, 1Spatial will provide project management to ensure on time deliveries and raise concerns quickly. 1Spatial uses a combination of the Rational Unified Process and agile project management to create and maintain a plan for delivery.

Throughout the lifecycle of the project, a Weekly Progress Report will be submitted to the Agency and DTMB Project Managers. Each weekly progress report will contain the following:

Accomplishments: Indicate what was worked on and what was completed during the current reporting period.

- **Plans:** Indicate what will be worked on over the next reporting period
- **Funds**: Indicate the amount of funds expended during the current reporting period, and the cumulative total to date for the project.
- **Outstanding issues/defects:** Indicate all outstanding issues or defects that need to be resolved for each active milestone and associated timelines for resolution of each issue.
- **Risks:** Updates to the **Risk Catalog** indicating open risks, how they can be mitigated and their likelihood of occurrence.

9.4.2. Communication

During this project efforts will be made to ensure that the team (both 1Spatial and Michigan members) are in constant contact and do not duplicate efforts. 1Spatial plans for weekly meetings to demonstrate progress at times and dates convenient to Michigan. 1Spatial project staff will be available to support via

phone and email, M-F 8am to 5pm. Queries outside these hours will be responded to at the start of next business day.

9.4.3. Documentation

1Spatial will document the tests in two ways. First a Test Specification describing the status of each ruleset (table based) with a description of each test and any refinements required.

The Tests will be supported by an Esri File GeoDatabase for future use.

1Spatial will update the Test Plan to include performance tests for the new solution. Test Plan will be submitted for SOM to review and accept

1Spatial will provide a full product documentation set for latest version of 1Integrate, as well as access to 1Spatial's online help portal.

9.5. Risks

Example data to be provided by Michigan Center for Shared Solutions (CSS) prior to the beginning of work. Format has been agreed to be SDE Geodatabase drawn from a SQL Server 2014. Any alteration from this raises the risk of the format not being supported. An alteration would require a re-assessment of this SOW with potential increase in associated costs.

Phase	Risk	Mitigation	Impact
All	Resource constraints of vendor team	1Spatial has access to additional resources within 1Spatial Group	High
All	Resource constraints of State of Michigan team	Holding biweekly planning calls, 1Spatial and SOM will have regular calls to schedule the resources for the upcoming work	High
ALL	COVID-19 Travel Restrictions for Training	Remote Trainings using GoToTraining solution	Medium

9.6. Pre-requisites

Example data to be provided by Michigan Center for Shared Solutions (CSS) prior to the beginning of work.

9.7. Assumptions

Phase	Assumption

All	Michigan Center for Shared Solutions will provide data in the following formats • File GeoDatabase • Shape • Esri Enterprise Geodatabase
All	SOM assumes responsibility for any down-time caused by the failure or maintenance of the hosted system
All	Esri's Workflow Manager restricts the concurrent jobs to the number of cores available
911	911 Data Repository will use the NENA Standard for NG9-1-1 GIS Data Model approved June 12 2018.
Phase 1 **Phase 2**	We will use the existing Workflows defined by Esri (MDOT Workflow and Contributor Workflow) additional workflows are out of scope of this document
Optimizing 1Integrate	Timing metrics are based on rule being migrated from 1IFA. Adding additional rules, such as Proposal Validation, will reduce the performance. To test performance, the additional rules will be removed from the session.
USGS National Hydrography Dataset Rules Integration	1Spatial will only provide the existing NHD Rules approved by USGS. 1Spatial will not perform additional configuration of the rules. Michigan and 1Spatial will report back any recommendations to USGS for consideration.

9.8. Quality Assurance and Management

1Spatial Inc. is committed to the delivery of quality product and defining our position in the marketplace as an organization that understands how relevant factors arising from statutory, regulatory, political, economic, social, and technological issues influence our strategic direction and our organizational context.

1Spatial maintains an ISO9001:2015 accreditation as a commitment to our quality management. We have held this accreditation since 2011 and was recently re-certified for the next three years by the external auditor QSR.

User Acceptance Testing (UAT) will be performed by Michigan Center for Shared Solutions (CSS) using rules provided by 1Spatial during the phases. Support (under the current Michigan Center for Shared Solutions (CSS) support contract) will be provided to assist in the setup of these rules, however additional rule creation and updates to the solution will be considered out of scope. These may be handled by an agreement for additional work detailed by a future SOW.

AGENCY (STATE) RESPONSIBILITIES:

SOM will have 2 weeks to test and accept deliveries unless otherwise stated in the document.

9.9. Key Personnel

State of Michigan (SOM)	1Spatial
Mark Holmes **DTMB Center for Shared Solutions** **Geospatial Services** **Romney Bldg. 10th Floor** **111 S Capital Ave** **Lansing, MI 48933** **517-241-6469** **Holmesm3@michigan.gov**	Michael Martin Technical Architect 1Spatial Inc. 8614 Westwood Center Drive Vienna, VA 22182 703.444.9488 michael.martin@1spatial.com
Cheryl Granger Project Manager **DTMB Center for Shared Solutions** **Geospatial Services** **Romney Bldg. 10th Floor** **111 S Capital Ave** **Lansing, MI 48933** **810-335-5102** **Grangerc1@michigan.gov**	James Blacker Project Manager 1Spatial Inc. 8614 Westwood Center Drive Vienna, VA 22182 703.444.9488 james.blacker@1spatial.com

10. Appendix A – 911 Validations

10.1. Essential Geometric Checks

	Check	Description
C1	Duplicate Features	Two features with the exact same geometry
C2	Duplicate Vertices	Two consecutive vertices with the same x,y values at the precision of the dataset
C3	Kickbacks	A line segment that changes 180 forming a Z shape
C4	Spikes	Three consecutive vertices (ABC) which Distance between AB is less than BC Sine of the angle ABC is less than sine of 1 degree (configurable) AB is under a maximum tolerance (optional, configurable)
C5	Features are valid (OGC specification)	Lines must have at least 2 points and a length greater than 0

10.2. Boundary Features (e.g. PSAP, EMS, ESZ, Fire, County, etc...)

	Check	Description
	Attribute Checks	See **NENA Attribute Validations**
C6	Essential Geometric Checks	Includes: Check for Overlaps
C7	Check for Gaps/Coverage	Boundary linework edge matching between boundary types. This is mostly done via gap/coverage.
C8	State specific business rules	Examples include: County/City must be inside a single PSAP, PSAP must me inside a single County. This depends on how things are implemented in the State.

10.3. Point Features (e.g. Address Points, Site Structure Points)

	Check	Description
	Attribute Checks	See **NENA Attribute Validations**
	Essential Geometric Checks	

C9	Check that there are no Point Features with the same Address attributes within the Zip Code.	A scalar comparison

10.4. Road Features

	Check	Description
	Attribute Checks	See **NENA Attribute Validations**
	Essential Geometric Checks	Includes: Check for Overlaps/Duplicate
C10	Check Min Length	
C11	Check for Undershoots/Overshoots	
C12	Check Road is in network (i.e. touches another Road)	
C13	Check Road is broken at intersections. (i.e. Road touches other Roads at end, Road does not cross another Road).	
C14	Address Numbers are valid (Left From, Left To, Right From, Right To)	
C15	Left/Right Address Range is valid (Left/Right side is either both zeros or both not zeros)	
C16	Left/Right Parity values matches Left/Right Address Range Numbers	
C17	Road Feature's Address Range does not overlap another Road Feature's Address Range	a scalar comparison

C18	Address Range values increase in same direction on both sides (i.e. one side does not increase while the other side decreases). Note: Some anomalies might exist.

10.5. Boundary Features vs Road Features

	Check
C19	Road Features are broken at Boundary Features
C20	Road Feature boundary attributes match that of containing Boundary Feature.

10.6. Boundary Features vs Point Features

	Check
C21	Check that Point Feature is inside one Boundary Feature.
C22	Check that the Point Feature attributes match that of containing Boundary Feature.
C23	Check that there are no Point Features with the same Address attributes within the Boundary Feature. Used for the ESN or PSAP.

10.7. Point Features vs MSAG

	Check
C24	Point Feature has a matching record in the MSAG and ALI table.

10.8. Road Features at Intersection Points

	Check	Description
C25	Checks Roads with the same name that touch at an intersection.	The attributes for a side of a Road are compared to the attributes of a side of the other touching Road. The sides of the roads compared depend on whether the Road geometries start or end at the intersection. • Parity attributes match across intersection. • Address Range Numbers increase or decrease consistently across intersection. • Address Range Numbers do not overlap across intersection. Note: Optional, as there is another more inclusive check for overlapping address ranges. However, this might be useful as more specific/superseding error report.

	• Bifurcation: No more than 2 roads with the same name intersect at a point.

10.9. Point Features vs Road Features

	Check	Description
C2	Points Features are associated to nearby Road Features and classified as left or right of Road Feature	Here, "nearby" is an ambiguous term. The method of finding potential "nearby" roads depends on the implementation. • All Address Attributes (e.g. StreetName, StreetPreDir, Zip Code) of a Point Feature match the Address Attributes of nearby Road. Note: If the Point Feature's address attributes don't match a nearby road, no association to a road is considered and the following rules are not run on the Point.ap • Point Feature Address Number Parity matches Road Feature for Parity for given side. • Point Feature Address Number is within Road Feature Address Range for given side. • Point Feature Address Numbers are ordered along Road. (A.K.A. Fishbone)

10.10. NENA Attribute Validations

10.10.1. Required Layers

Layer Type	Layer Name	Attribute Name	Attribute Type (Mandatory, Conditional, Optional)
Required_Layers	Emergency_Medical_Services	Avcard_URI	Mandatory
Required_Layers	Emergency_Medical_Services	Agency_ID	Mandatory
Required_Layers	Emergency_Medical_Services	DateUpdate	Mandatory
Required_Layers	Emergency_Medical_Services	DiscripAgID	Mandatory
Required_Layers	Emergency_Medical_Services	DsplayName	Mandatory

Required_Layers	Emergency_Medical_Services	Global ID	Mandatory
Required_Layers	Emergency_Medical_Services	ServiceURI	Mandatory
Required_Layers	Emergency_Medical_Services	ServiceURN	Mandatory
Required_Layers	Emergency_Medical_Services	State	Mandatory
Required_Layers	Emergency_Medical_Services	Effective	Optional
Required_Layers	Emergency_Medical_Services	Expire	Optional
Required_Layers	Emergency_Medical_Services	ServiceNum	Optional
Required_Layers	Fire	Avcard_URI	Mandatory
Required_Layers	Fire	Agency_ID	Mandatory
Required_Layers	Fire	DateUpdate	Mandatory
Required_Layers	Fire	DiscripAgID	Mandatory
Required_Layers	Fire	DsplayName	Mandatory
Required_Layers	Fire	Global ID	Mandatory
Required_Layers	Fire	ServiceURI	Mandatory
Required_Layers	Fire	ServiceURN	Mandatory
Required_Layers	Fire	State	Mandatory
Required_Layers	Fire	Effective	Optional
Required_Layers	Fire	Expire	Optional
Required_Layers	Law	Avcard_URI	Mandatory
Required_Layers	Law	Agency_ID	Mandatory
Required_Layers	Law	DateUpdate	Mandatory
Required_Layers	Law	DiscripAgID	Mandatory
Required_Layers	Law	DsplayName	Mandatory
Required_Layers	Law	Global ID	Mandatory
Required_Layers	Law	ServiceURI	Mandatory

Required_Layers	Law	ServiceURN	Mandatory
Required_Layers	Law	State	Mandatory
Required_Layers	Law	Effective	Optional
Required_Layers	Law	Expire	Optional
Required_Layers	Law	ServiceNum	Optional
Required_Layers	PSAP_Boundary	Avcard_URI	Mandatory
Required_Layers	PSAP_Boundary	Agency_ID	Mandatory
Required_Layers	PSAP_Boundary	DateUpdate	Mandatory
Required_Layers	PSAP_Boundary	DiscripAgID	Mandatory
Required_Layers	PSAP_Boundary	DsplayName	Mandatory
Required_Layers	PSAP_Boundary	Global ID	Mandatory
Required_Layers	PSAP_Boundary	ServiceURI	Mandatory
Required_Layers	PSAP_Boundary	ServiceURN	Mandatory
Required_Layers	PSAP_Boundary	State	Mandatory
Required_Layers	PSAP_Boundary	Effective	Optional
Required_Layers	PSAP_Boundary	Expire	Optional
Required_Layers	PSAP_Boundary	ServiceNum	Optional
Required_Layers	Provisioning_Boundary	DateUpdate	Mandatory
Required_Layers	Provisioning_Boundary	DiscripAgID	Mandatory
Required_Layers	Provisioning_Boundary	Global ID	Mandatory
Required_Layers	Provisioning_Boundary	Effective	Optional
Required_Layers	Provisioning_Boundary	Expire	Optional
Required_Layers	Road_Centerlines	AdNumPre_L	Conditional
Required_Layers	Road_Centerlines	AdNumPre_R	Conditional
Required_Layers	Road_Centerlines	AddCode_L	Conditional

Required_Layers	Road_Centerlines	AddCode_R	Conditional
Required_Layers	Road_Centerlines	ESN_L	Conditional
Required_Layers	Road_Centerlines	ESN_R	Conditional
Required_Layers	Road_Centerlines	LSt_Name	Conditional
Required_Layers	Road_Centerlines	LSt_PosDir	Conditional
Required_Layers	Road_Centerlines	Lst_PreDir	Conditional
Required_Layers	Road_Centerlines	LSt_Type	Conditional
Required_Layers	Road_Centerlines	MSAGComm_L	Conditional
Required_Layers	Road_Centerlines	MSAGComm_R	Conditional
Required_Layers	Road_Centerlines	St_PosDir	Conditional
Required_Layers	Road_Centerlines	St_PosMod	Conditional
Required_Layers	Road_Centerlines	St_PosTyp	Conditional
Required_Layers	Road_Centerlines	St_PreDir	Conditional
Required_Layers	Road_Centerlines	St_PreMod	Conditional
Required_Layers	Road_Centerlines	St_PreSep	Conditional
Required_Layers	Road_Centerlines	St_PreTyp	Conditional
Required_Layers	Road_Centerlines	Country_L	Mandatory
Required_Layers	Road_Centerlines	Country_R	Mandatory
Required_Layers	Road_Centerlines	County_L	Mandatory
Required_Layers	Road_Centerlines	County_R	Mandatory
Required_Layers	Road_Centerlines	DateUpdate	Mandatory
Required_Layers	Road_Centerlines	DiscrpAgID	Mandatory
Required_Layers	Road_Centerlines	FromAddr_L	Mandatory
Required_Layers	Road_Centerlines	FromAddr_R	Mandatory
Required_Layers	Road_Centerlines	Global ID	Mandatory

Required_Layers	Road_Centerlines	IncMuni_L	Mandatory
Required_Layers	Road_Centerlines	IncMuni_R	Mandatory
Required_Layers	Road_Centerlines	Parity_L	Mandatory
Required_Layers	Road_Centerlines	Parity_R	Mandatory
Required_Layers	Road_Centerlines	St_Name	Mandatory
Required_Layers	Road_Centerlines	State_L	Mandatory
Required_Layers	Road_Centerlines	State_R	Mandatory
Required_Layers	Road_Centerlines	ToAddr_L	Mandatory
Required_Layers	Road_Centerlines	ToAddr_R	Mandatory
Required_Layers	Road_Centerlines	Effective	Optional
Required_Layers	Road_Centerlines	Expire	Optional
Required_Layers	Road_Centerlines	NbrhdCom_L	Optional
Required_Layers	Road_Centerlines	NbrhdCom_R	Optional
Required_Layers	Road_Centerlines	OneWay	Optional
Required_Layers	Road_Centerlines	PostCode_L	Optional
Required_Layers	Road_Centerlines	PostCode_R	Optional
Required_Layers	Road_Centerlines	PostComm_L	Optional
Required_Layers	Road_Centerlines	PostComm_R	Optional
Required_Layers	Road_Centerlines	RoadClass	Optional
Required_Layers	Road_Centerlines	SpeedLimit	Optional
Required_Layers	Road_Centerlines	UnincCom_L	Optional
Required_Layers	Road_Centerlines	UnincCom_R	Optional
Required_Layers	Road_Centerlines	Valid_L	Optional
Required_Layers	Road_Centerlines	Valid_R	Optional
Required_Layers	Site_Structure_Address_Points	St_Name	Conditional

Required_Layers	Site_Structure_Address_Points	AddCode	Conditional
Required_Layers	Site_Structure_Address_Points	AddDataURI	Conditional
Required_Layers	Site_Structure_Address_Points	AddNum_Pre	Conditional
Required_Layers	Site_Structure_Address_Points	AddNum_Suf	Conditional
Required_Layers	Site_Structure_Address_Points	Add_Number	Conditional
Required_Layers	Site_Structure_Address_Points	ESN	Conditional
Required_Layers	Site_Structure_Address_Points	LSt_Name	Conditional
Required_Layers	Site_Structure_Address_Points	LSt_PosDir	Conditional
Required_Layers	Site_Structure_Address_Points	Lst_PreDir	Conditional
Required_Layers	Site_Structure_Address_Points	LSt_Type	Conditional
Required_Layers	Site_Structure_Address_Points	LandmkName	Conditional
Required_Layers	Site_Structure_Address_Points	MSAGComm	Conditional
Required_Layers	Site_Structure_Address_Points	Mile_Post	Conditional
Required_Layers	Site_Structure_Address_Points	St_Name	Conditional
Required_Layers	Site_Structure_Address_Points	St_PosDir	Conditional
Required_Layers	Site_Structure_Address_Points	St_PosMod	Conditional
Required_Layers	Site_Structure_Address_Points	St_PosTyp	Conditional
Required_Layers	Site_Structure_Address_Points	St_PreDir	Conditional
Required_Layers	Site_Structure_Address_Points	St_PreMod	Conditional
Required_Layers	Site_Structure_Address_Points	St_PreSep	Conditional
Required_Layers	Site_Structure_Address_Points	St_PreTyp	Conditional
Required_Layers	Site_Structure_Address_Points	Country	Mandatory
Required_Layers	Site_Structure_Address_Points	County	Mandatory
Required_Layers	Site_Structure_Address_Points	DateUpdate	Mandatory
Required_Layers	Site_Structure_Address_Points	DiscrpAgID	Mandatory

Required_Layers	Site_Structure_Address_Points	Inc_Muni	Mandatory
Required_Layers	Site_Structure_Address_Points	Site_NGUID	Mandatory
Required_Layers	Site_Structure_Address_Points	State	Mandatory
Required_Layers	Site_Structure_Address_Points	Addtl_Loc	Optional
Required_Layers	Site_Structure_Address_Points	Building	Optional
Required_Layers	Site_Structure_Address_Points	Effective	Optional
Required_Layers	Site_Structure_Address_Points	Elevation	Optional
Required_Layers	Site_Structure_Address_Points	Expire	Optional
Required_Layers	Site_Structure_Address_Points	Floor	Optional
Required_Layers	Site_Structure_Address_Points	Lat	Optional
Required_Layers	Site_Structure_Address_Points	Long	Optional
Required_Layers	Site_Structure_Address_Points	Nbrhd_Comm	Optional
Required_Layers	Site_Structure_Address_Points	Place_Type	Optional
Required_Layers	Site_Structure_Address_Points	Placement	Optional
Required_Layers	Site_Structure_Address_Points	Post_Code	Optional
Required_Layers	Site_Structure_Address_Points	Post_Code4	Optional
Required_Layers	Site_Structure_Address_Points	Post_Comm	Optional
Required_Layers	Site_Structure_Address_Points	Room	Optional
Required_Layers	Site_Structure_Address_Points	Seat	Optional
Required_Layers	Site_Structure_Address_Points	Uninc_Comm	Optional
Required_Layers	Site_Structure_Address_Points	Unit	Optional

10.10.2. Strongly Recommended

Layer Type	Layer Name	Attribute Name	Attribute Type (Mandatory, Conditional, Optional)
Strongly_Recommended_Layers	Complete_Landmark_Name_Alias_Table	ACLandmark	Conditional
Strongly_Recommended_Layers	Complete_Landmark_Name_Alias_Table	ACLMNNGUID	Mandatory
Strongly_Recommended_Layers	Complete_Landmark_Name_Alias_Table	DateUpdate	Mandatory
Strongly_Recommended_Layers	Complete_Landmark_Name_Alias_Table	DiscrpAgID	Mandatory
Strongly_Recommended_Layers	Complete_Landmark_Name_Alias_Table	Site_NGUID	Mandatory
Strongly_Recommended_Layers	Complete_Landmark_Name_Alias_Table	Effective	Optional
Strongly_Recommended_Layers	Complete_Landmark_Name_Alias_Table	Expire	Optional
Strongly_Recommended_Layers	Counties	CntyNGUID	Mandatory
Strongly_Recommended_Layers	Counties	Country	Mandatory
Strongly_Recommended_Layers	Counties	County	Mandatory
Strongly_Recommended_Layers	Counties	DateUpdate	Mandatory
Strongly_Recommended_Layers	Counties	DiscrpAgID	Mandatory
Strongly_Recommended_Layers	Counties	State	Mandatory

Strongly_Recommended_Layers	Counties	Effective	Optional
Strongly_Recommended_Layers	Counties	Expire	Optional
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	AddCode	Conditional
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	DateUpdate	Mandatory
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	Country	Mandatory
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	County	Mandatory
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	DiscrpAgID	Mandatory
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	IncM_NGUID	Mandatory
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	Inc_Muni	Mandatory
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	State	Mandatory
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	Effective	Optional
Strongly_Recommended_Layers	Incorporated_Muni_Boundary	Expire	Optional
Strongly_Recommended_Layers	Landmark_Name_Part_Table	ACLMNNGUID	Conditional
Strongly_Recommended_Layers	Landmark_Name_Part_Table	LMNP_NGUID	Conditional
Strongly_Recommended_Layers	Landmark_Name_Part_Table	Site_NGUID	Conditional
Strongly_Recommended_Layers	Landmark_Name_Part_Table	DateUpdate	Mandatory
Strongly_Recommended_Layers	Landmark_Name_Part_Table	DiscrpAgID	Mandatory
Strongly_Recommended_Layers	Landmark_Name_Part_Table	LMNP_Order	Mandatory

Strongly_Recommended_Layers	Landmark_Name_Part_Table	LMNamePart	Mandatory
Strongly_Recommended_Layers	Landmark_Name_Part_Table	Effective	Optional
Strongly_Recommended_Layers	Landmark_Name_Part_Table	Expire	Optional
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	AddCode	Conditional
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	UnincCommB	Conditional
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	DateUpdate	Mandatory
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	DiscrpAgID	Mandatory
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	Country	Mandatory
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	County	Mandatory
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	Global ID	Mandatory
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	Inc_Muni	Mandatory
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	Nbrhd_Comm	Mandatory
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	State	Mandatory
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	Effective	Optional
Strongly_Recommended_Layers	Neighborhood_Comm_Boundary	Expire	Optional
Strongly_Recommended_Layers	States	DateUpdate	Mandatory
Strongly_Recommended_Layers	States	DiscrpAgID	Mandatory
Strongly_Recommended_Layers	States	Country	Mandatory

Strongly_Recommended_Layers	States	Global ID	Mandatory
Strongly_Recommended_Layers	States	State	Mandatory
Strongly_Recommended_Layers	States	Effective	Optional
Strongly_Recommended_Layers	States	Expire	Optional
Strongly_Recommended_Layers	Street_Name_Alias_Table	ALStName	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	ALStPosDir	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	ALStPreDir	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	ALStTyp	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_PosDir	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_PosMod	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_PosTyp	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_PreDir	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_PreMod	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_PreSep	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_PreTyp	Conditional
Strongly_Recommended_Layers	Street_Name_Alias_Table	DateUpdate	Mandatory
Strongly_Recommended_Layers	Street_Name_Alias_Table	DiscrpAgID	Mandatory
Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_NGUID	Mandatory

Strongly_Recommended_Layers	Street_Name_Alias_Table	Ast_Name	Mandatory
Strongly_Recommended_Layers	Street_Name_Alias_Table	RCL_NGUID	Mandatory
Strongly_Recommended_Layers	Street_Name_Alias_Table	Effective	Optional
Strongly_Recommended_Layers	Street_Name_Alias_Table	Expire	Optional
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	AddCode	Conditional
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	DateUpdate	Mandatory
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	DiscrpAgID	Mandatory
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	Country	Mandatory
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	County	Mandatory
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	Global ID	Mandatory
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	State	Mandatory
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	Uninc_Comm	Mandatory
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	Effective	Optional
Strongly_Recommended_Layers	Unincorporated_Comm_Boundary	Expire	Optional

10.10.3. Recommended Layers

Layer Type	Layer Name	Attribute Name	Attribute Type (Mandatory, Conditional, Optional)
Recommended_Layers	Cell_Site_Location	Cmarket_ID	Conditional
Recommended_Layers	Cell_Site_Location	Csite_Name	Conditional
Recommended_Layers	Cell_Site_Location	ESRD_ESRK	Conditional
Recommended_Layers	Cell_Site_Location	ESRK_Last	Conditional
Recommended_Layers	Cell_Site_Location	Lat	Conditional
Recommended_Layers	Cell_Site_Location	Long	Conditional
Recommended_Layers	Cell_Site_Location	Site_ID	Conditional
Recommended_Layers	Cell_Site_Location	Switch_ID	Conditional
Recommended_Layers	Cell_Site_Location	CSctr_Ornt	Mandatory
Recommended_Layers	Cell_Site_Location	Cell_NGUID	Mandatory
Recommended_Layers	Cell_Site_Location	Country	Mandatory
Recommended_Layers	Cell_Site_Location	County	Mandatory
Recommended_Layers	Cell_Site_Location	DateUpdate	Mandatory
Recommended_Layers	Cell_Site_Location	DiscripAgID	Mandatory
Recommended_Layers	Cell_Site_Location	Sector_ID	Mandatory
Recommended_Layers	Cell_Site_Location	State	Mandatory
Recommended_Layers	Cell_Site_Location	Technology	Mandatory
Recommended_Layers	Cell_Site_Location	Site_NGUID	Optional
Recommended_Layers	Hydrology_Line	DateUpdate	Mandatory
Recommended_Layers	Hydrology_Line	DiscripAgID	Mandatory
Recommended_Layers	Hydrology_Line	Global ID	Mandatory
Recommended_Layers	Hydrology_Line	HS_Name	Optional
Recommended_Layers	Hydrology_Line	HS_Type	Optional

Recommended_Layers	Hydrology_Polygon	DateUpdate	Mandatory
Recommended_Layers	Hydrology_Polygon	DiscripAgID	Mandatory
Recommended_Layers	Hydrology_Polygon	Global ID	Mandatory
Recommended_Layers	Hydrology_Polygon	HP_Name	Optional
Recommended_Layers	Hydrology_Polygon	HP_Type	Optional
Recommended_Layers	Mile_Marker_Location	MileM_Type	Conditional
Recommended_Layers	Mile_Marker_Location	MileM_Unit	Conditional
Recommended_Layers	Mile_Marker_Location	DateUpdate	Mandatory
Recommended_Layers	Mile_Marker_Location	DiscripAgID	Mandatory
Recommended_Layers	Mile_Marker_Location	Global ID	Mandatory
Recommended_Layers	Mile_Marker_Location	MileMValue	Mandatory
Recommended_Layers	Mile_Marker_Location	MileM_Ind	Mandatory
Recommended_Layers	Mile_Marker_Location	MileM_Rte	Mandatory
Recommended_Layers	Railroad_Centerlines	RLOP	Conditional
Recommended_Layers	Railroad_Centerlines	RLOWN	Conditional
Recommended_Layers	Railroad_Centerlines	DateUpdate	Mandatory
Recommended_Layers	Railroad_Centerlines	DiscripAgID	Mandatory
Recommended_Layers	Railroad_Centerlines	Global ID	Mandatory
Recommended_Layers	Railroad_Centerlines	RLNAME	Optional
Recommended_Layers	Railroad_Centerlines	RMPH	Optional
Recommended_Layers	Railroad_Centerlines	RMPL	Optional

11. Appendix B – MGF Feature Layer List

This list contains the 31 MGF feature layers for which 1Spatial will create validation sessions in 1Integrate. Each session will be used in the MGF_Validate process for that feature layer.

1. City
2. County
3. Township
4. Village
5. SchoolDistrict
6. IntermediateSchoolDistrict
7. StateSenate
8. StateHouse
9. USHouseDistrict
10. CensusTract
11. CensusBlockGroup
12. VotingPrecinct
13. CensusDesignatedPlace
14. PSAP
15. PA425Zone
16. ProsperityRegion
17. Road
18. DNRStateForestRoad
19. SiteAddressPoint
20. TaxParcel
21. NHDPoint
22. NHDLine
23. NHDArea
24. NHDWaterBody
25. Culvert
26. DEQWatershedBoundary
27. EmergencyServiceZone
28. StatePark
29. UnincorporatedCommunity
30. WatershedBoundary
31. AdjustedCensusUrbanBoundary
32. Railroad

MGF feature layers which will not have their own validation session include: StateBoundary, IntersectionPoint, GeodeticControlPoint, StateForest, Bridge, drinking water layers, storm water layers, and wastewater layers. These layers can be used in the main validation sessions. For example, The Road validation session will reconcile the Road features with the InterSectionPoint features.

12. Appendix C – MGF Contribution Layer Table

This table enumerates the 33 Contribution Layers and their 1IFA rulesets. 1Spatial will create Contributor workflows in 1Integrate for the following layers. In Phase One, each Contributor workflow will consist five sessions. One for each of the five processes: Contributor Load, Contributor Validate, Change Detection, MGF Update, and MGF Validate. Some sessions will be shared across feature layers.

Layer	CL Ruleset	CV Ruleset	CD Ruleset	MU Ruleset
City	StandardCity_Schema_General Contributor	Contributor_Validate	StandardCity_Change_Detection	StandardCity_Update
County	StandardCounty_Schema_General Contributor	Contributor_Validate	StandardCounty_Change_Detection	StandardCounty_Update
Township	StandardTownship_Schema_General Contributor	Contributor_Validate	StandardTownship_Change_Detection	StandardTownship_Update
Village	StandardVillage_Schema_General Contributor	Contributor_Validate	StandardVillage_Change_Detection	StandardVillage_Update
School District	StandardSchoolDistrict_Schema_General Contributor	Contributor_Validate	StandardSchoolDistrict_Change_Detection	StandardSchoolDistrict_Udate
IntermediateSchoolDistrict	StandardIntermediateSchoolDistrict_Schema_General Contributor	Contributor_Validate	StandardIntermediateSchoolDistrict_Change_Detection	StandardIntermediateSchoolDistrict_Udate
StateHouse	StandardStateHouse_Schema_General Contributor	Contributor_Validate	StandardStateHouse_Change_Detection	StandardStateHouse_Update
Local Road/County Roads	StandardRoad_Schema_<Locality>	Contributor_Validate	StandardRoad_Change_Detection	StandardRoad_Update
MDOT Road	LRSStandardRoad_Schema_MDOT	Contributor_Validate	LRSStandardRoad_Change_Detection	LRSStandardRoad_Update
Trail	TrailStandardRoad_Schema_DNR	Contributor_Validate	TrailStandardroad_Change_Detection	TrailStandardRoad_Update

DNR State Forest Road	StandardDNRStateForestRoad_Schema_DNR	Contributor_Validate	StandardDNRStateForestRoad_Change_Detection	StandardDNRStateForestRoad_Update
PSAP	StandardPSAP_Schema_General Contributor	Contributor_Validate	StandardPSAP_Change_Detection	StandardPSAP_Update
EmergencyServiceZone	StandardEmergencyServiceZone_Schema_General Contributor	Contributor_Validate	StandardEmergencyServiceZone_Change_Detection	StandardEmergencyServiceZone_Update
StateSenate	StandardStateSenate_Schema_General Contributor	Contributor_Validate	StandardStateSenate_Change_Detection	StandardStateSenate_Update
USHouseDistrict	StandardUSHouseDistrict_Schema_General Contributor	Contributor_Validate	StandardUSHouseDistrict_Change_Detection	StandardUSHouseDistrict_Update
CensusTract	StandardCensusTract_Schema_General Contributor	Contributor_Validate	StandardCensusTract_Change_Detection	StandardCensusTract _Update
CensusBlockGroup	StandardCensusBlockGroup_Schema_General Contributor	Contributor_Validate	StandardCensusBlockGroup_Change_Detection	StandardCensusBlockGroup _Update
VotingPrecinct	StandardVotingPrecinct_Schema_General Contributor	Contributor_Validate	StandardVotingPrecinct_Change_Detection	StandardVotingPrecinc _Update
CensusDesignatedPlace	StandardCensusDesignatedPlace_Schema_General Contributor	Contributor_Validate	StandardCensusDesignatedPlace_Change_Detection	StandardCensusDesignatedPlace _Update
PA425Zone	StandardPA425Zone_Schema_General Contributor	Contributor_Validate	StandardPA425Zone_Change_Detection	StandardPA425Zone _Update
ProsperityRegion	StandardProsperityRegion_Schema_General Contributor	Contributor_Validate	StandardProsperityRegion_Change_Detection	StandardProsperityRegion _Update
SiteAddressPoint	StandardSiteAddressPoint_Schema_General Contributor	Contributor_Validate	StandardSiteAddressPoint_Change_Detection	StandardSiteAddressPoint _Update

TaxParcel	StandardTaxParcel_Schema_General Contributor	Contributor_Validate	StandardTaxParcel_Change_Detection	StandardTaxParcel _Update
NHDPoint	StandardNHDPoint_Schema_General Contributor	Contributor_Validate	StandardNHDPoint_Change_Detection	StandardNHDPoint _Update
NHDLine	StandardNHDLine_Schema_General Contributor	Contributor_Validate	StandardNHDLine_Change_Detection	StandardNHDLine_Update
NHDArea	StandardNHDArea_Schema_General Contributor	Contributor_Validate	StandardNHDArea_Change_Detection	StandardNHDArea _Update
NHDWaterBody	StandardNHDWaterBody_Schema_General Contributor	Contributor_Validate	StandardNHDWaterBody_Change_Detection	StandardNHDWaterBody _Update
Culvert	StandardCulvert_Schema_MDOT	Contributor_Validate	StandardCulvert_Change_Detection	StandardCulvert_Update
DEQWatershed	StandardDEQWatershed_Schema_General Contributor	Contributor_Validate	StandardDEQWatershed_Change_Detection	StandardDEQWatershed _Update
StatePark	StandardStatePark_Schema_General Contributor	Contributor_Validate	StandardStatePark_Change_Detection	StandardStatePark _Update
UnincorporatedCommunity	StandardUnincorporatedCommunity_Schema_General Contributor	Contributor_Validate	StandardUnincorporatedCommunity_Change_Detection	StandardUnincorporatedCommunity_Update
WatershedBoundary	StandardWatershedBoundary_Schema_General Contributor	Contributor_Validate	StandardWatershedBoundary_Change_Detection	StandardWatershedBoundary_Update
AdjustedUrbanCensusBoundary	StandardAdjustedUrbanCensusBoundary_Schema_General Contributor	Contributor_Validate	StandardAdjustedUrbanCensusBoundary_Change_Detection	StandardAdjustedUrbanCensusBoundary_Update
Railroad	StandardRailroad_MDOT	Contributor_Validate	StandardRailRoad_Change_Detection	StandardRailroad_Update

MGF feature layers which will not have their own Contributor Workflows include: Administrative StateBoundary, Shoreline StateBoundary, IntersectionPoint, GeodeticControlPoint, StateForest, Bridge, drinking water layers, storm

water layers, and wastewater layers. For GeodeticControlPoint, CSS can directly upload data through ArcMap and manually run the 1Integrate session that will identify non-conformances against the essential geometry checks. Training will be provided on this process to the SOM.

13. Appendix D – Detailed Training Description

13.1. Training Summary

Training for 1Spatial products is customized to meet the needs of each client. When possible, training is conducted onsite with a Technical Trainer to provide the instruction, though remote training is possible with no alterations to course materials. Objectives, prerequisites, course outlines, and deliverable documents are outlined for each type of training below.

13.2. Introductory Training

The Introductory Training to the 1Integrate Enterprise is a 4-day course followed by a 1-day workshop. As a suggested prerequisite, participants should have previous experience with GIS or a map production environment, a database environment such as Oracle, and basic knowledge of object-oriented design concepts. The objectives of the Introductory Training are to familiarize participants with the 1Integrate interface, connect to an external data source, develop an understanding of the 1Integrate rule builder, and assess data quality based on defined rules.

The first day of training will introduce the 1Integrate interface, creating data stores and sessions, and writing basic rules. The second day of training will cover basic actions, action maps, rules on two classes, and If-Then structure. The third day will focus on multiple existence conditions, For All structure, rule templates, object labels, and built-in functions. The last two days of the training will be structured as workshops that will go through additional examples from the MGF Validation session.

13.2.1. Prerequisites (Recommended)

- GIS/map production experience
- Database experience

13.2.2. Documentation

Prior to the training, SOM will receive a PDF of the 1Integrate Rules and Basic Concepts manual, as well as a compressed file of the Training geodatabase. By the end of the training, the following documents will be delivered to SOM:

- 1Integrate Rules and Basic Concepts (PDF)
- 1Integrate Introductory Training slides (PDF)
- 1Integrate Training Reference Sheet (PDF)
- Stock Training geodatabase (compressed file)
- Client Sample Data (compressed file)
- 1Integrate Backup Rules (xml)

13.3. Advanced Training

The Advanced Training to 1Integrate is a 4-day course with a follow on 1-day. Participants should have taken the 1Integrate Introductory Training as a prerequisite to the Advanced Training. The training focuses on enhancement, reporting non-conformances, and utilizing actions and action maps to create proposals or corrections to data.

The first day of the course reviews the concepts taught in the Introductory Training, reintroduces actions and action maps, and highlights new key concepts for advanced rule writing. The second day of training covers building actions, creating action maps, and using geometry built-in functions. The third day introduces basic topology functionality, including snapping, connectivity, and polygonization. The fourth day of the training will cover vintage over vintage. The final day of the Advanced Training is structured as a workshop and is tailored to the interests and wants of the participants.

13.3.1. Prerequisites

- Completion of 1Integrate Introductory Training

13.3.2. 2.2. Documentation

Prior to the training, SOM will receive a PDF of the 1Integrate Actions and Advanced Concepts manual, as well as a compressed file of the Training geodatabase. By the end of the training, the following documents will be delivered to SOM:

- 1Integrate Actions and Advanced Concepts (PDF)
- 1Integrate Advanced Training slides (PDF)
- 1Integrate Training Reference Sheet (PDF, from the Introductory Training)
- Stock Training geodatabase (compressed file)
- Client Sample Data (compressed file)
- 1Integrate Backup Rules (xml)

13.4. 1DataGateway Training

The 1DataGateway Training is a 3-day course. This training will introduce 1DataGateway, and provide participants an overview of the interface, administration of users and projects, and how to run and review sessions. All participants will need to have completed the 1Integrate Introductory training as a prerequisite for the 1DataGateway training.

The first day of the training will provide participants with a review of 1Integrate concepts, including data stores, rules, actions, and sessions, and will introduce the 1DataGateway interface. The second day of training covers adding users, suppliers, and projects to 1DataGateway as well as administering projects and users and completing a submission. The third day will have participants review submission results and using the dashboard to monitor submissions.

13.4.1. Prerequisites

- Completion of 1Integrate Introductory Training

13.4.2. Documentation

Prior to the training, SOM will receive a PDF of the 1DataGateway manual, as well as a compressed file of the Training geodatabase. By the end of the training, the following documents will be delivered to SOM:

- 1DataGateway manual (PDF)
- 1DataGateway Training slides (PDF)
- Stock Training geodatabase (compressed file)
- Client Sample Data (compressed file)

13.5. 1DataGateway Administer and Contributor Training

The 1DataGateway Training is a 1-day course that focuses on administrative features and how to submit data as a contributor. The contributor training provided as part of this course walks participants through the steps that a data contributor would take to submit their data in 1DataGateway. This course is geared towards administrators and requires participants to have taken the 1Integrate Introductory Training as a prerequisite; it is recommended that participants have also taken the 1DataGateway Training.

13.5.1. Prerequisites

- Completion of 1Integrate Introductory Training
- Completion of 1DataGateway Training (recommended)

13.5.2. Documentation

Prior to the training, SOM will receive PDFs of the 1DataGateway manual and the 1DataGateway Data Contributor manual, as well as a compressed file of the Training geodatabase. After the training, the following documents will be delivered to SOM:

- 1DataGateway manual (PDF)
- 1DataGateway Training slides (PDF)
- 1DataGateway Data Contributor Training manual (PDF)
- 1DataGateway Data Contributor Training slides (PDF)

- Stock Training geodatabase (compressed file)
- Client Sample Data (compressed file)

13.5.3. Additional Delivery Items

The 1DataGateway Administer Training also includes a 1DataGateway Contributor Training (described in X.5). 1Spatial will lead the initial 1DataGateway Contributor training to provide an example to SOM.

13.6. 1DataGateway Contributor Training (2-hour remote session)

The 1DataGateway Contributor Training is a 2-hour session that will demonstrate how to submit data through the 1DataGateway interface as a data contributor. These sessions do not require prior knowledge of 1Integrate or 1DataGateway. The session will cover using 1DataGateway as a data contributor, from signing in and managing the user account to submitting data and reviewing the submission results. This session provides a demonstration of how to use 1DataGateway as a data contributor and finishes with an open forum for data contributors to ask questions.

13.6.1. Prerequisites

- None.

13.6.2. Documentation

Prior to the training, SOM will receive a PDF of the 1DataGateway Data Contributor Training manual and information on how to connect to the remote training session. SOM will need to distribute this information to potential data contributors before the start of the session. After the training, the following documents will be delivered to SOM:

- 1DataGateway Data Contributor Training manual (PDF)
- 1DataGateway Data Contributor Training slides (PDF)

13.7. Knowledge Transfer Training

The Knowledge Transfer training will take place over the course of the project. 1Spatial will provide documentation for review and use on

- Workflow Creation and Onboarding – adding a new workflow (layer) or a new contributor to an existing layer to the system for data submission
- Change Detection – identify the different types of proposals produced by change detection
- Validation Manual – a guide on maintaining and update validations including modifying tolerances and severity
- 1Integrate Performance – a guide on implementing performance optimizations used during the project for layers. This will cover using the contributor and process regions, grouping workflow steps and actions.
- 1Integrate Toolbox – manual for parameters of the 1Integrate toolbox
- Cache Maintenance – cleaning the 1Integrate cache and temporary directory
- Capturing features/minute metrics from 1Integrate

13.7.1. Prerequisites

- Completion of 1Integrate Introductory Training
- Completion of 1Integrate Advanced Training

13.7.2. Documentation

Prior to the training, SOM will receive a PDF of the 1DataGateway Data Contributor Training manual and information on how to connect to the remote training session. SOM will need to distribute this information to potential data contributors before the start of the session. After the training, the following documents will be delivered to SOM:

- Contributor Onboarding manual (PDF)
- Change Detection Type manual (PDF)
- Validation manual (PDF)
- 1Integrate Performance manual (PDF)
- 1Integrate Toolbox manual (PDF)

- 1Integrate Cache manual (PDF)

14. Appendix E – Test Plan

MGF Test Plan

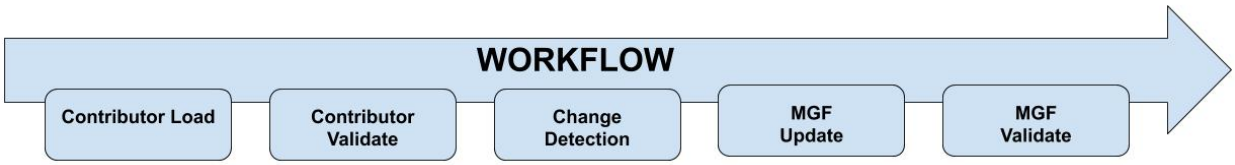


Figure 1 - The Full MGF Workflow

14.1. Division of Testing

Testing of the MGF system will be divided by the two major functional goals of validating data and fixing data. This is realized by separating the MGF Validate functionality from the rest of the MGF Workflow, for the purpose of testing. In general, MGF Validate will be tested before the rest of the workflow.

This is done for multiple reasons:

- This separation breaks testing into the less complex categories of 1) Updating, and 2) Validating. Testing is simplified because testers can focus on the immediate matter at hand.
- Once complete, The MGF Validate is the best test for the results of the workflow.
- The MGF Validate can be easily tested outside the workflow.
- This avoids duplication of testing as each MGF Validate is used by multiple workflows. For instance, all Road workflows will feed into the same MGF Validate.
- SOM should aspire to understand and take control of the MGF Validate first.
    - Validation rules are the simplest aspects of 1Integrate technology.
    - Validation rules are easiest for a new rule author to write.
    - Validation rules are the best candidate for introducing 1Integrate technology.
    - SOM needs to understand the validation paradigm at the start of the project.
    - SOM needs to be able to adjust nonconformance priority levels without the aid of 1Spatial, at the start of the project.
    - SOM should be able to add simple validation rules without the aid of 1Spatial, shortly after the start of the project.

14.2. Management of Testing

During the project, 1Spatial management and SOM shall maintain common lists of major entities to be tested, and their status. These lists are mainly defined by the testing process that will be performed on the entities within the list. These lists shall be three:

- **Validation** – This is a list of MGF feature classes, for which an MGF Validate session is to be tested. Entities in this list will undergo the MGF Validate Testing process (described below) to be accepted.
- **Workflow** – This is a list of Contributor Workflow, for which an MGF Workflow is to be tested. Entities in this list will undergo the MGF Workflow Testing process (described below) to be accepted.
- **General** – This is a list of major issues/defects that need to be addressed. Testing for items in this list will be focused and will not undergo a defined process. Besides the benefits of a general list, a key purpose of this list is to address defects within functionality that has already been accepted without repeating the rigor of the original acceptance test. The entities contained in this list shall be agreed to by both the SOM and 1Spatial.

Besides, these management lists of major entities/functionalities to be tested, there will probably be minor list of defects (e.g. all the things that need to be fixed for the City Workflow to pass). This section is not addressing those.

14.2.1. Testing for Initial Phases

Initial testing of the MGF system will commence with MGF Validate Testing. It will be followed by MGF Workflow Testing. However, these testing processes can be performed simultaneously so long as they involve different target MGF Feature Classes. Once an MGF feature class passes MGF Validate Testing, the workflow(s) for that feature class can commence MGF Workflow Testing.

In the Initial Phase, once the MGF Validate Session or the MGF Workflow has been accepted, they should not go thru the rigorous testing process again. However, 1Spatial and SOM will want to maintain test procedures and test data for use with regression testing concerning future work.

14.2.2. Testing for Subsequent Phases and Future Work

When new functionality is added to the workflow, it will go thru the testing process relevant to the changes in the workflow. For instance, if we add functionality to perform Vintage Over Vintage Change Detection on a workflow, then those changes will undergo the MGF Workflow Testing and they will not undergo the MGF Validate Testing. Likewise, if a new suite of validation rules is added to the Parcel validation, these changes will undergo MGF Validate Testing, and not the MGF Workflow Testing.

14.3. MGF Validate Testing

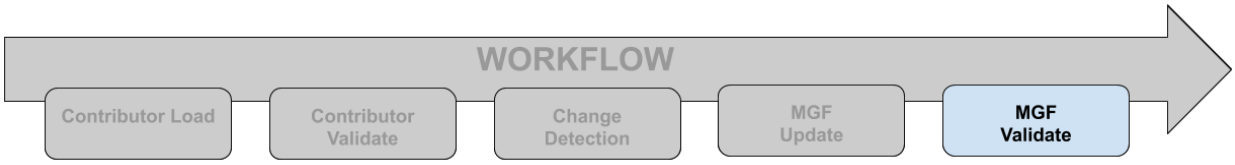


Figure 1 - MGF Validate is tested without the rest of the workflow.

An MGF Validate process/session validates multiple feature classes at a time but each one is focused on an MGF Feature class. Thus, for the purpose of acceptance, testing will be focused on a ‘per MGF Feature Class’ basis.

The key focus of MGF Validate Testing is the validation rules and creation of Report features. There may be a limited focus on the reading of MGF Features into the session and writing of Report features out of the session. There is no focus on the initiation or control of a session within a workflow, that is the focus of the MGF Workflow Testing.

MGF Validate Testing should make sure:

- Validation rules identify errors or nonconformances.
- Validation rules do not identify false positives.
- Validation rules, Report Features, and nonconformant features have the correct QC severity.
- Validation rules, Report Features, and nonconformant features have the correct QC message.
- Report features are created with a point geometry at the location of the error or the location of the originating feature (if locating the error is not possible).
- Report features are not duplicated (if possible)

14.3.1. Unit Testing

1Spatial will create test cases for the purpose of testing the validation rules. Tests cases will be created for each validation rule.

1Spatial will create 1Integrate Enterprise testing sessions that do the following:

1) Load test data.
2) Run validation rules and create Report features

3) Load expected result data
4) Compare the results to the expected results.

These testing sessions will be different from the MGF Validate sessions. 1Spatial may be able to create unit tests that incorporate the MGF Validate sessions (optional).

Test data and expected results data will be stored in and loaded from an ESRI File Geodatabase.

These unit test shall be performed at 1Spatial. Testing sessions and test data will be delivered to SOM.

14.3.2. IAT Testing

Internal Acceptance Testing will be performed by 1Spatial and SOM in the DEV environment.

Each MGF feature class (in the Validation list) will be tested one at a time.

Using 1Integrate Enterprise, testers will run the MGF Validate session for the given MGF feature class over a desired extent. Testers will inspect the results of the validation and ensure the validation rules are performing as desired.

Once 1Spatial has determined that the MGF Validate session has passed IAT testing, the session will be queued for UAT testing.

14.3.3. UAT Testing

User Acceptance Testing

Using 1Integrate, SOM will run the MGF Validate session for the given MGF feature class over a desired extent. SOM will inspect the results of the validation and ensure the validation rules are performing as desired.

Once SOM has determined that the MGF Validate session has passed UAT testing, the MGF Validate session shall be considered accepted.

14.4. MGF Workflow Testing

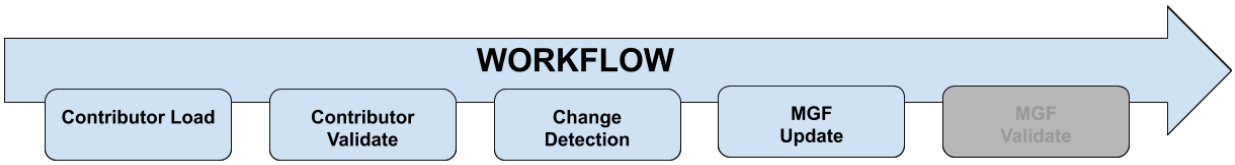


Figure 2 - Workflow Testing

MGF Workflow Testing is performed on a ‘per workflow basis’.

MGF Workflow Testing should make sure:

- Workflow
  - The Contribution Table record is updated with the relevant feature statistics after each process step. This includes: Layer Status, Contributor Feature Count, Contributor Feature Errors, Contributor Feature Error Percent, New MGF Feature Count, and MGF Feature Errors.
  - A Data Reviewer session is created after the Contributor Validate step.
  - The Data Reviewer session is populated with the Contributor Validation Report features.
  - A Data Reviewer session is created after the MGF Validate step.
  - The Data Reviewer session is populated the MGF Validate Report features.

    - Fatal errors are recorded in the Error Notification table.
- Contributor Load
    - Staging features are created for each input Contributor feature.
    - Staging feature attributes are populated with the values mapped from the Contributor features.
    - Staging feature attributes are populated with metadata regarding the contribution.
- Contributor Validate
    - The validation rules are generally working (Note: Validation rules\functionality in the Contributor Validate session are 98% reused from the MGF Validate session. Most of the validation functionality will be tested there).
    - Report features are created for validation errors with the Staging feature.
- Change Detection
    - ADD Proposal features are created for all staging features that are new and have no equivalent in the existing MGF feature class.
    - DELETE Proposal features are created for features that exist in the MGF feature class but have no equivalent in the Staging feature class.
    - SCALAR CHANGE Proposal features are created for all staging features that have an equivalent feature in the MGF feature class, and, whose attributes have changed.
    - RESHAPE Proposal features are created for all staging features that have an equivalent feature in the MGF feature class, and, whose geometry has changed.
- MGF Update
    - New MGF Features are created for each ADD Proposal feature.
    - MGF features are deleted for each DELETE Proposal feature.
    - MGF feature attributes have been changed for reach SCALAR CHANGE Proposal feature.
    - MGF Feature geometries have been changed for each RESHAPE Proposal feature.

14.4.1. Unit Testing

There is no plan to do special test cases for MGF Workflow Testing.

14.4.2. IAT Testing

Internal Acceptance Testing will be performed by 1Spatial and SOM in the DEV environment.

Each Contributor workflow (in the Workflow list) will be tested one at a time.

Testers will contribute feature class data via the MGF contribution system, and the functionality of the workflow shall be evaluated. The testers will verify that the workflow identifies and applies the correct changes as desired. This testing process is expected to proceed in the same manner as the past two years.

Once 1Spatial has determined that a Contributor workflow has passed IAT testing, the performance metrics for the layer will be recorded, and the workflow will be queued for UAT testing.

14.4.3. UAT Testing

User Acceptance Testing will be performed by SOM in the QA environment.

Each Contributor workflow (in the Workflow list) will be tested one at a time.

Testers will contribute feature class data via the MGF contribution system, and the functionality of the workflow shall be evaluated. The SOM will verify that the workflow identifies and applies the correct changes as desired. This testing process is expected to proceed in the same manner as the past two years.

Once SOM has determined that a Contributor Workflow has passed UAT testing, the performance metrics will be recorded, and the workflow will be considered accepted.

14.5. Performance Metrics and Testing

Performance metrics for each contributor workflow will be recorded during IAT and UAT testing.

Metrics will be recorded for each process step (i.e. Contributor Load, Contributor Validate, Change Detection, MGF Update, and MGF Validate). These metrics are:

- The feature read time for the 1Integrate Session.
- The feature read count for the 1Integrate session.
- The rule processing time for the 1Integrate Session.
- The feature write time for the 1Integrate Session.
- The feature write count for the Integrate Session
- The total time for processing the 1Integrate Session.
    - Note: This is the sum of the feature read time, the rule processing time, and the feature write time.
- The total time of the Process.
    - This is the time for the 1Integrate Session, as well as any process overhead.

The total time for the Contributor Workflow will be recorded as the sum of the times for the 5 process steps. The total time for the Contributor Workflow will be what is measured against for the performance metrics in the contract.

14.6. Pretest Software

14.6.1. 1Integrate

Once installed 1Integrate will be tested with the following steps to ensure it is working as expected.

1. Login as an administrator
2. Upload the TestBackup.xml file which contains
    a. Data Store: Test Data Store
    b. Rule: Validate Spikes
    c. Action: Markup Spikes
    d. Session: Test Session
3. Update the Test Data Store
    a. Configure the Input Details
        i. Upload the Training.gdb.zip (provided by 1Spatial)
    b. Configure the Input Mapping
4. Run the Test Session
5. Download the data from the Test Data Store Output Details

14.6.2. Data Gateway

1. Login as the administrator
2. Create a project (Based on the Test Session above)
3. Create a new contributor
4. Link the contributor to the project
5. Log in as the contributor
6. Upload the Training.gdb.zip
7. Confirm the data submits, the session runs

STATE OF MICHIGAN

Contract No. 200000000971

Schedule C
PRICING

Below is the summary of pricing by year for the various components of the effort.

Note: Software estimates are based on expected contributor/data increases over time as well as performance estimates to meet State Service Level Agreements (SLAs).Should the quantities estimated exceed whatthe state deems is necessary, the State is in no way obligated to purchase the additional licenses estimated for each year.

State of MI - DTMB	FY Year 1	FY Year 2	FY Year 3	FY Year 4	FY Year 5	Totals
Licensing	$39,300.00	$215,460.00	$252,375.00	$302,100.00	$338,240.00	$1,147,475.00
Implementation						
1Integrate Enterprise	$228,216.00	$92,914.00				$321,130.00
Configuration Optimization		$145,788.00				$145,788.00
9-1-1 Module	$246,993.00					$246,993.00
Submission Portal		$149,529.00				$149,529.00
USGS Rule set		$4,000.00				$4,000.00
Training	$13,500.00	$13,500.00				$27,000.00
Documentation	$159,804.00	$236,085.00				$395,889.00
Workflow Infrastructure Review (Optional)		$205,749.00				$205,749.00

Totals	**$687,813.00**	**$1,063,025.00**	**$252,375.00**	**$302,100.00**	**$338,240.00**	**$2,643,553.00**

Option Years	Option Yr 1	Option Yr 2	Option Yr 3	Option Yr 4	Option Yr 5	Total
Licensing	$343,314	$348,463	$353,690	$358,996	$364,381	**$1,768,843**

Quick payment terms: ____2____ % discount off invoice if paid within _____10___ days after receipt of invoice.

STATE OF MICHIGAN

Contract No. 200000000971

SCHEDULE D
License Agreement

1. DEFINITIONS:

Agreement: this Software License Agreement, together with its Schedules;

License Term: means the duration of the license for the Software as set out in Schedule 1 to this Agreement;

Licensed Environment: means the environment(s) in respect of which Licensee has a license to use the Software (i.e. Production Environments and/or Non-Production Environments), as set out in Parts 1 and 2 of Schedule 1 to this Agreement;

Non-Production Environment: means an environment in which the Software is used by Licensee only for development, testing, and staging purposes only, and/or or as a passive failover or cold stand-by resource;

Production Environment: means any environment which is not a Non-Production Environment;

Purpose: has the meaning set out in Schedule 1;

2. LICENSE

2.1. Subject to and conditional upon Licensee's compliance with the terms and conditions of this Agreement, in consideration of the payment of the Fees, Contractor hereby grants to the State a non-exclusive, worldwide, non-transferable, non-sub-licensable limited right and license for the State's Personnel

to access and use the Software in the Licensed Environment(s) for the Purpose via the Deployment Method(s) during the License Term.

2.2. "Use" of the Software pursuant to clauses 1.1, 2.1, 2.2, 2.3 and 2.4 shall be restricted to access to and use of the Software in object code form, and shall include any act which is reasonably incidental to such use, including the creation of a reasonable number of backup copies of the Software, and "using" shall be construed accordingly.

2.3. Save as provided by this Agreement, the license granted under clause 3.1 is not transferable and may not be sub-licensed, shared or accessed by anyone other than The State, acting through its Personnel.

3. PERMITTED USE

3.1. Subject to clause 3.2 below, the maximum number of Named Users and/or Session Queues using or accessing the Software in each Licensed Environment may not exceed the Maximum Volume.

3.2. The State shall, within 30 days after the end of each calendar year, submit to Contractor a written report setting out the extent to which the number of Named Users and/or Session Queues using or accessing the Software exceeded the Maximum Volume in such calendar month, in sufficient detail to allow Contractor to calculate a pro-rated portion of then applicable contract Fees to cover such excess use ("Excess Use Charges"). The Excess Use Charges are the sole and exclusive remedy for exceeding the Maximum Volume in such calendar month.

3.3. The Software may only be used in the appropriate Licensed Environment(s), as set out in the Schedules to this Agreement. In particular, Software which is licensed for use in a Non-Production Environment may not be used in a Production Environment except as a passive failover or cold stand by resource. See definition of Non-Production Environment.

3.4. Where the Software is licensed on a Named User basis:

(a) The State must set out the Named Users in the Schedule 2 forms to this Agreement;

(b) The State may not substitute or replace Named Users without Contractor's prior written approval (such approval not to be unreasonably withheld or delayed); and

(c) during the License Term the State must provide Contractor with an up-to-date and accurate copy of the Schedule 2 forms to this Agreement within seven (7) Business Days of Contractor's written request.

3.5. The State shall:

(a) comply with all of Contractor's reasonable instructions in respect of the State's access to and use of the Software;

(b) notify Contractor as soon as it becomes aware of any unauthorized use of the Software;

(c) promptly install and use any Maintenance Release(s) provided by Contractor to the State;

(d) keep the license key(s), login, password and other account details provided by Contractor for access to the Software (if any) strictly confidential and not share such information with third parties that are not Named Users under this Agreement. The State shall be solely responsible,

and liable, for keeping such login, password and other account details confidential, and shall not share them with any third party for any reason without Contractor's prior written consent;

3.6. The State shall not, and shall ensure that the State's Personnel do not:

(a) in whole or in part, copy, adapt, reverse engineer, decompile, disassemble, modify, adapt or make error corrections to the Software for any purpose (including, without limitation, any activity which has as its objective the disclosure or the source code of the Software, or the determination of the performance characteristics or other behavioral characteristic of the Software),or permit or facilitate any third party to do any of the above, except as expressly permitted by this Agreement or by Applicable Law;

(b) use any proprietary information protected under this Agreement, or Confidential Information provided by 1Spatial under this Agreement to create any software, products or services which compete with, or are substantially similar to that of, the Software, nor use such proprietary information or Confidential Information in any manner which would be restricted by any copyright or other Intellectual Property Rights subsisting in it; or

(c) sell, offer for sale, resell, license, sub-license, rent, loan, distribute or otherwise provide any third party or person with access to the Software other than as expressly permitted by this Agreement.

4. EXPORT

4.1. Neither Party shall export, directly or indirectly, any technical data acquired from the other Party under this Agreement (or any products, including software, incorporating any such data) in breach of any Applicable Law, including United States export laws and regulations ("Export Control Laws"), to any country for which the government or any agency thereof at the time of export requires an export license or other governmental approval without first obtaining such license or approval.

4.2. Each party undertakes:

(a) contractually to oblige any third party to whom it discloses or transfers any such data or products to make an undertaking to it in terms no less onerous than clause 3.1 above; and

(b) if requested, to provide the other Party with any reasonable assistance, at the reasonable cost of the other Party, to enable it to perform any activity required by any competent government or agency in any relevant jurisdiction for the purpose of compliance with any Export Control Laws.

5. NON-SOLICITATION

5.1. Neither Party will, during the Term, solicit or endeavor to entice away and consequently employ, any person who is employed or engaged by the other Party in any services which are directly relevant to the State's use of and access to, or Contractor's provision of, the Software. This provision shall not prevent either Party from employing any of the other Party's Personnel who have made an unsolicited response to a general recruitment advertisement published by or on behalf of the first Party.

SCHEDULE 1 - 2020

License Agreement Number:	
Date of issue:	
Licensee	
Licensee Address:	

PART 1: PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine	Session Queue	3		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020

PART 2: NON-PRODUCTION ENVIRONMENT LICENSES 2020

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine – Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020

The **"Purpose**" is general use for the Licensee's internal business purposes.

SCHEDULE 2 -2020

NAMED USERS

License Agreement Number:	
Date of issue:	
Licensee:	
Licensee Address:	

Named Users allocations for Software licensed under this Agreement:

PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			
	3	**State provide name**			
	4	**State provide name**			
	5	**State provide name**			

NON-PRODUCTION ENVIRONMENTS

ID from Schedule 1	Named User #	Named User Name			
	1	State provide name			
	2	State provide name			

SCHEDULE 1 - 2021

License Agreement Number:	
Date of issue:	
Licensee	
Licensee Address:	

PART 1: PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine	Session Queue	3		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020

PART 2: NON-PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine – Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020

The **"Purpose**" is general use for the Licensee's internal business purposes.

SCHEDULE 2 - 2021

NAMED USERS

License Agreement Number:	
Date of issue:	
Licensee:	
Licensee Address:	

Named Users allocations for Software licensed under this Agreement:

PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			
	3	**State provide name**			
	4	**State provide name**			
	5	**State provide name**			

NON-PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			

SCHEDULE 1 - 2022

License Agreement Number:	
Date of issue:	
Licensee	
Licensee Address:	

PART 1: PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine	Session Queue	4		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020

PART 2: NON-PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine – Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020

	1Data Gateway Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020

The **"Purpose**" is general use for the Licensee's internal business purposes.

SCHEDULE 2 - 2022

NAMED USERS

License Agreement Number:	
Date of issue:	
Licensee:	
Licensee Address:	

Named Users allocations for Software licensed under this Agreement:

PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			
	3	**State provide name**			
	4	**State provide name**			
	5	**State provide name**			

NON-PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			

SCHEDULE 1 - 2023

License Agreement Number:	
Date of issue:	
Licensee	
Licensee Address:	

PART 1: PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine	Session Queue	5		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020

PART 2: NON-PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To

	1Integrate – Base plus one engine – Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020

The **"Purpose"** is general use for the Licensee's internal business purposes.

SCHEDULE 2 - 2023

NAMED USERS

License Agreement Number:	
Date of issue:	
Licensee:	
Licensee Address:	

Named Users allocations for Software licensed under this Agreement:

PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			

	1	**State provide name**			
	2	**State provide name**			
	3	**State provide name**			
	4	**State provide name**			
	5	**State provide name**			

NON-PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			

SCHEDULE 1 - 2024

License Agreement Number:	
Date of issue:	
Licensee	
Licensee Address:	

PART 1: PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine	Session Queue	6		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020

PART 2: NON-PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine – Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020

The **"Purpose**" is general use for the Licensee's internal business purposes.

SCHEDULE 2 - 2024

NAMED USERS

License Agreement Number:	
Date of issue:	
Licensee:	
Licensee Address:	

Named Users allocations for Software licensed under this Agreement:

PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			
	3	**State provide name**			
	4	**State provide name**			
	5	**State provide name**			

NON-PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			

SCHEDULE 1 – Option Years 1-5

License Agreement Number:	
Date of issue:	
Licensee	
Licensee Address:	

PART 1: PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To

	1Integrate – Base plus one engine	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine	Session Queue	6		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway	Session Queue	1		On-Premise	dd/mm/yyyy	12/31/2020

PART 2: NON-PRODUCTION ENVIRONMENT LICENSES

ID	Software	License Type	Maximum Volume	Fees and invoicing arrangements	Deployment Method	License Term	
						Licensed From	Licensed To
	1Integrate – Base plus one engine – Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Integrate – Additional Engine Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020
	1Data Gateway Non-Production	Session Queue	2		On-Premise	dd/mm/yyyy	12/31/2020

The **"Purpose**" is general use for the Licensee's internal business purposes.

SCHEDULE 2 – Option Years 1-5

NAMED USERS

License Agreement Number:	
Date of issue:	
Licensee:	
Licensee Address:	

Named Users allocations for Software licensed under this Agreement:

PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			
	3	**State provide name**			
	4	**State provide name**			
	5	**State provide name**			

NON-PRODUCTION ENVIRONMENTS					
ID from Schedule 1	**Named User #**	**Named User Name**			
	1	**State provide name**			
	2	**State provide name**			

STATE OF MICHIGAN

Contract No. TBD

SCHEDULE E
Maintenance and Support

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** to this Schedule shall have the respective meanings given to them in the Contract.

"Beta Program" has the meaning of early access to software that is undergoing testing and has not yet been officially released

"**Commencement Date**" has the meaning of the date shown in the Contract Renewal Schedule on which software maintenance will commence under the terms and conditions of this Agreement.

"**COTS Product**" has the meaning of Commercial Off-The-Shelf product, software that is ready-made and available for sale.

"**Contact List**" means a current list of Contractor contacts and telephone numbers set forth in the attached **Exhibit 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.

"**Enhancement**" has the meaning of modifications or additions to existing capability within the licensed software and documentation.

"**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.

"**Installation address**" has the meaning of the location where the licensed software is installed/hosted

"**Issue**" has the meaning of a failure, fault, inefficiency or potential enhancement in functionality that produces an incorrect, unexpected or inefficient result in the licenced software or documentation.

"Low Service Error" has the meaning set forth in the Service Level Table.

"**Maintenance**" has the meaning of delivery of licensed software releases made available during the period of this agreement, as defined in Schedule 1 of this agreement.

"**Medium Service Error**" has the meaning set forth in the Service Level Table.

"**Remote Access**" has the meaning of Remote Access support tools which are software that enable a support representative to connect to a remote computer from their consoles via the Internet and work directly on the remote system.

"**Resolve**" and the correlative terms, "**Resolved**", "**Resolving**" and "**Resolution**" each have the meaning set forth in **Section 2.6**

"**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 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 2.6**

"**Service Requests**" means a request for assistance made by the Customer to 1Spatial's Support Desk.

"**Software**" means versions of the licensed Software products as defined in Schedule 1 of this Agreement.

'**Software Release**" means a release of the licensed software which adds new functionality, corrects faults or otherwise amends or upgrades the product

"**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"** means technical support provided by 1Spatial's Support Team to help users resolve specific problems with the licensed software.

'**Support Case**" means the record that is maintained through the lifecycle of a service request.

"**Support Desk**" means the centralised Support Desk operated by 1Spatial in accordance with the requirements of the Contract.

"**Support Hours**" means 8 a.m. to 5 p.m. Eastern, Monday thru Friday .

"**Support Lead**" means a member of the 1Spatial Customer Support team assigned to administer the support element of an individual account.

"**Support Package**" means the 3 Tiers of Support Packages offered by 1Spatial – Standard, Advanced and Premium

"**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 3.2**

"**Third Party Software**" means commercial software developed by a Third Party vendor, licenced, supported and resold by 1Spatial.

"**Workaround**" means a process to address an issue in the software for which a release has not yet been made but which allows the customer to achieve the required result.

2. Maintenance.

2.1 Maintenance Releases and New Versions. Provided that the State is current on its Support Services Fees, during the Support Period, Contractor shall provide the State, at no additional charge, with all Maintenance Releases and New Versions for the Software.

2.2 Installation. The State has no obligation to install or use any Maintenance Release or New Version. If the State wishes to install any Maintenance Release or New Version, the State shall have the right to have such Maintenance Release or New Version installed, in the State's discretion, by Contractor or other authorized party. Contractor shall 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. 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.

3. 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 3**.

3.1 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.

3.2 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 3.4** (each a "**Support Request**"). The State shall notify Contractor of each Support Request by e-mail or telephone. The State shall include in each Support Request a description of the reported Error and the time the State first observed the Error.

3.3 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.

3.4 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:

14.6.3.

Support Request Classification	**Service Level Metric** **(Required Response Time)**	**Service Level Metric** **(Required Resolution Time)**	**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	Two (2) hours	Two (2) Business Days	During Implementation - Ten percent (10%) of the Fees for the milestone being worked on at the time the Service Level Failure begins. During Maintenance and Support - An amount equal to 10% of the then	During Implementation - Ten percent (10%) of the Fees for the milestone being worked on at the time the Service Level Failure begins. During Maintenance and Support - An amount equal to 10% 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.	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.
High Service Error	Three (3) hours	Two (2) Business Days	During Implementation - Seven percent (7%) of the Fees for the milestone being worked on at the time the Service Level Failure begins. During Maintenance and Support - An amount equal to 7% 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.	During Implementation - Seven percent (7%) of the Fees for the milestone being worked on at the time the Service Level Failure begins. During Maintenance and Support - An amount equal to 7% 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.

Medium Service Error	Four (4) hours	Three (3) Business Days	During Implementation - Five percent (5%) of the Fees for the milestone being worked on at the time the Service Level Failure begins. During Maintenance and Support - An amount equal to 5% 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.	During Implementation - Five percent (5%) of the Fees for the milestone being worked on at the time the Service Level Failure begins. During Maintenance and Support - An amount equal to 5% 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.
Low Service Error	Four (4) hours	Five (5) Business Days	During Implementation - Three percent (3%) of the Fees for the milestone being worked on at the time the Service Level Failure begins.	During Implementation - Three percent (3%) of the Fees for the milestone being worked on at the time the Service Level Failure begins.

3.5 Escalation to Parties' Project Managers. 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 parties' respective Project Managers and then to their respective Contract Administrators.

3.6 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.

3.7 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.

4. Service Credits.

4.1 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 response exceeds the required Response time.	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.

4.2 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.

4.3 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 thirty (30) 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.

4.4 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.

5. 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.

6. 1Spatial Product Support and Maintenance

6.1 The Standard 1Spatial Support Package provides a Support Desk Service and a Maintenance program for software. It includes:

Support and Maintenance cover is provided for cases that can be replicated in the currently supported release of 1Spatial products and Third-Party software, where that product is running on an unaltered, supported hardware, database and operating system configuration. The supported configurations for 1Spatial products and Third-Party software will be specified in the product release notes or installation guides.

Unless otherwise stated this Support and Maintenance agreement applies to the Support and Maintenance for all 1Spatial products and Third-Party software delivered by 1Spatial.

- The provision of a Support Desk Service to receive, log and manage the lifecycle of all issues raised against the licensed software
- Access to 1Spatial software specialists to assist with software support and fault diagnosing
- The investigation, diagnosis and resolution of faults arising with software and/or documentation
- Access to the 1Spatial Customer Portal to log, track and update support cases online
- Remote Access Support
- Access to Online Product Documentation
- Delivery of any product upgrades made during the period of this agreement

6.2 Standard Software Support Descriptions of Service

- 1Spatial provides a centralized Support Desk Service for raising service requests for assistance with the licenced software.
- The 1Spatial Support Desk will be operated between the hours of 8:00 AM to 5:00 PM (ET time), Monday-Friday, excluding local public holidays.
- Service Requests include the following:
    - Suspected Software Issues: The customer suspects the Software is functioning incorrectly and requires a software fix
    - Software Support: The customer seeks advice or guidance in the use of the Software for its intended function
- The customer can request assistance from the Support Desk via email, telephone or online through the 1Spatial Customer Portal.

- Each new request to the Support Desk will be logged in a Support Desk call-handling system where a unique call reference number will be allocated. An initial response will be provided to each Support Desk request that will detail the unique reference number, a suggested priority and summary of action.
- 1Spatial will provide email or telephone assistance to the Customer to enable communications with 1Spatial's software specialists during the core hours specified above.
- Where a fault requires a software or documentation change in a 1Spatial product, an issue will be logged in the 1Spatial internal issue tracking system. 1Spatial will work with the State to determine a reasonable amount of time to resolve the issue dependant upon the complexity of the required change.
- 1Spatial will provide basic support to assist with the installation of the software listed in Schedule 1 of this Agreement. Specialist onsite installation and configuration services are provided as part of the Advanced Support Package or can be procured separately.
- In order to isolate the issue, 1Spatial reserves the right to request that replication details are provided for a non-customized, 'vanilla' environment.
- If specialist help is required to debug issues encountered within a customized environment not reproducible in a standard or 'vanilla' environment, the support provided will not be subject to the targeted response and resolution times described in section 4.1
- Where a fault requires a software or documentation change in Third Party licenced software included in Schedule 1, an issue will be logged with the vendor. 1Spatial is not responsible for the schedule of issue fixes for any Third-Party software but will communicate priorities on behalf of the customer
- Where the issues cannot be replicated or where further assistance is required to troubleshoot the problem, 1Spatial will engage with the vendor to obtain assistance.
- 1Spatial will pass on suggestions for enhancements to the vendor for supported Third Party software. Although there is no guarantee any suggestion will be included in a future release, suggestions frequently influence product development decisions