

ATTACHMENT A

CONSULTANT SCOPE OF SERVICES

Contract # K-1920-49

Task Work Order Three (3)- Scope of Work

City of Norman Traffic Management Center Systems Implementation and Post Design Support

Background

In 2019, the City of Norman competitively procured a professional services consultant (Stantec or “Consultant”) to perform the Systems Engineering Analysis (SEA) for the proposed Norman Traffic Management Center (NTMC) design, under Task Work Order (TWO) one. Several SEA documents were developed by the Consultant including the NTMC Concept of Operations (ConOps), system requirements, system communications and project ITS architecture to meet requirements of the Federal Rule 940, a regulation related to Intelligent Transportation Systems (ITS) procurement using Federal funds. Upon reviewing potential NTMC locations, City selected the Human Resources/Information Technology (HR/IT) Building at 201-C West Gray Street, Norman, Oklahoma, with a dedicated TMC operations area, server room, offices, and conference room. After completion of the SEA, the City initiated the NTMC systems design and specifications development of three (3) innovative integrated Transportation Operator Consoles (iTOC) with Audio Video Over Internet Protocol (AV/IP) based communication systems, led by the Consultant as the Engineer of Record (EOR) firm, under Task Work Order 2. One more iTOC (fourth) will also be procured but stored for future deployment with no design or integration necessary. An Architect retained by the City is leading the design of the building infrastructure for the NTMC. Pursuant to this Task Work Order 3, Stantec will provide System Implementation and Post-Design support.

Project Responsibilities

It is our understanding that the procurement framework will proceed as follows: Upon completion of the design effort, the Oklahoma Department of Transportation (ODOT) plans to retain a contractor (s) to procure/construct both types of services covering NTMC building as well as systems. Below is our understanding of the basic roles for each entity:

- *Federal Highway Administration (FHWA)* – Project sponsor
- *Oklahoma Department of Transportation (ODOT)* – Client-side Project Manager and Administrator for NTMC Construction and Systems Implementation
- *City of Norman*: Project Administrator for the design and oversight of systems procurement, and integration efforts. Self-perform NTMC server and switch connectivity for cyber-security and safety.
- *NTMC Systems Consultant (under City of Norman)*– Stantec Consulting as the System Implementation and Post-Design Support Consultant.

- *NTMC Architect (under City of Norman):* Lead designer of NTMC building related services as the AOR firm.
- *NTMC System Contractor (ODOT to procure and retain):*

System Contractor shall procure, install, integrate iTOC and AV/IP systems for a fully functional NTMC.

- *NTMC Building Contractor (ODOT to procure and retain)*

Building Contractor shall construct the NTMC.

1.0 Consultant Scope of Work

Under this TWO 3, the Consultant shall support the City in the system deployment including design and specifications (EOR), procurement, installation, integration, testing, documentation, go-live and conditional and final system acceptance.

The Consultant scope shall include the following key tasks:

- Project Management and Meetings
- Contractor Procurement Support
- NTMC Construction Support
- Integration and Testing Support
- Requirement Traceability Verification Matrix (RTVM) Development
- As-Built Plan Development
- Training Support and Standard Operating Procedures (SOP) Development
- Systems Engineering Validation

The Consultant shall provide these support services covering the entire duration of the project until NTMC operations start up, in accordance with the project schedule to be established upon selection of the System Contractor.

Detailed descriptions of each task are provided below.

1.1 PROJECT MANAGEMENT AND MEETINGS

Perform required project management duties including meetings and coordination with the City/ODOT/Architect/FHWA on contractual and technical matters, Norman IT, NTMC Architect, Contractor/vendors, and other parties, as necessary. Conduct/attend project management and technical meetings led by other parties, as necessary. The Consultant project manager shall be responsible for project administration and shall be the point of contact for contractual matters such as scope and fee

development for TWO preparations, invoicing, status reporting, project delivery schedule, quality control, and coordination with various parties. Project manager and other key members of the technical team shall conduct virtual/in person meetings, site visits, and other support tasks detailed in this document, as necessary. The Consultant will lead regular project technical coordination meetings on a weekly basis during the active period (system equipment procurement, installation/construction, testing and integration) and bi-weekly for the rest of the duration of the project limited to contractor's original schedule. Additional scope and fee will be submitted for approval to support Consultant services if the Contractor's schedule is extended.

1.2 PROCUREMENT SUPPORT

Consultant will support the City in its procurement of components, to be procured in compliance with the Oklahoma Competitive Bidding Act of 1974 and revised on November 1, 2021 (see link: <https://www.sai.ok.gov/Search%20FormsPubs/database/PCBA%20Handout%20Updated%2011.1.21.pdf>) to help outfit the NTMC for an integrated operations capability. ODOT will be responsible for enforcement and compliance to this act. After notice to proceed of TWO 3, Consultant shall propose for City approval an overall Procurement Plan containing schedule, key equipment, binding system requirements, delivery dates, factory testing dates, and shipping/receiving dates including monthly updates. Consultant will track the status of these procurements through regular coordination with the selected Systems Contractor.

1.2.1 Submittal Reviews and Request for Information (RFI)

The Consultant will abide by the following:

- Create submittal, shop drawing and RFI log with dates and resolutions,
- Review technical compatibility of equipment with plans and specifications,
- Review compatibility with the City IT systems requirements and coordinate for approval,
- Coordinate with City, ODOT and Federal staff as needed to ensure conformity with procedures, and
- Review equipment warranty requirements and coordinate with the Contractor to meet City/ODOT requirements.

For any significant deviation in procurement or design, Consultant shall provide updates to the design limited to three plan sheets. Consultant to coordinate with the City staff/ODOT regarding procurements and coordinate with the Architect in preparing their design/construction documents as necessary to accommodate NTMC system needs.

1.2.2 iTOC and System Components Procurement Verification

Consultant shall assist the City/ODOT in the procurement of the key NTMC systems equipment for design conformance. One of the key components is the iTOC – three for NTMC Room fully integrated and tested and the fourth for the Emergency Communications and Operations Center (ECOC), to be factory tested

and stored with no integration or system testing required. Each iTOC is composed of the furniture module, desk, drawers, electrical motor for console lowering and raising to allow sit and stand work options, and other cabinetry per plan design for enhanced ergonomics. Consultant will collaborate with Contractor/vendors and travel to vendor's facility (one visit) to observe the final iTOC furniture set up and factory tests, prior to shipping and delivery to NTMC per the Procurement Plan. Consultant's Oklahoma City office staff will assist in logistics and delivery confirmation of equipment, as necessary.

Additionally, Consultant will coordinate with the Contractor/vendors and observe the progress and procurement of four fully furnished and tested communication racks per plans and specifications. Each Rack will be fully wired with system equipment such as video processors, encoder/decoder, communication end equipment and power back up system. The Consultant shall review display monitors proposed to be supplied by the Contractor/vendor to verify they will fit each of the four iTOC furniture units and meet specifications. Consultant will undertake a site visit to the Contractor/vendor facility (one visit) to attend the factory/shop tests for Racks as well as associated equipment such as KVM processor, display monitors, Rack Personal Computers (RPC) and optionally, Layer 2 or Layer 3 as the key communication end equipment (City IT will configure these edge switches).

1.2.3 Architect/Building Contractor Coordination

The Consultant shall collaborate with the NTMC Architect and Building Contractor including systems procurement schedule throughout the contract duration. This Building Contractor shall be responsible for building modifications including structure, drywalling, lighting, plumbing, fire protection, raised and normal flooring, HVAC, electrical, and UPS/generator system etc. In addition, the building contractor will also be responsible for procurement and installation of above ceiling conduit, under raised flooring conduit and junction boxes to connect the three iTOCs per design plan.

Consultant to coordinate with the Architect/Building Contractor prior to each major system equipment delivery logistics, installation, integration, and testing activities for items such as iTOCs in NTMC Operations Floor, communications racks with display monitors in the NTMC server room and single display in conference room etc., where support from the Architect/Building Contractor for installation of conduit/wirings or power backup systems will be required.

1.3 NTMC CONSTRUCTION SUPPORT

Consultant shall review construction submittals and shop drawings related to the TMC systems covering iTOCs, conduits, junction boxes, low voltage and fiber communications, AV/IP equipment and software, system communications end equipment (video processor, encoder, decoder and Layer 2 and Layer 3 switches), communication racks, associated test plans and test results. In addition, Consultant will also review NTMC architectural submittals related to system equipment power, lighting, fire suppression, and cyber security. The subject areas not in direct expertise of the Consultant shall be subject to a high-level

cursory review. However, detailed reviews will be undertaken for building infrastructure related to systems electrical and communications for compatibility with the NTMC system design and specifications.

Consultant shall support the City of Norman/ODOT in administering the system infrastructure installation referenced above including regular meeting attendances with the selected TMC building modification contractor as well as System Contractor. Specifically, Consultant shall regularly review the construction schedule, inspect select installations in site, when necessary, provide responses to request for information (RFI), and help resolve implementation issues as appropriate.

It is to be noted that the Consultant is providing professional services and shall not have control over and shall not be responsible for construction means, methods, techniques or procedures of construction or the safety precautions and programs in connection with the construction work performed by the contractor.

1.4 INTEGRATION AND TESTING SUPPORT

Consultant shall conduct inspection of NTMC systems infrastructure and equipment once fully installed and assist in integration and testing activities. A review of the Integration Plan to be developed by the Systems Contractor will be conducted prior to standalone, subsystems, and system tests per specifications. Below are the details of the integration and testing activities to be supported:

- Witness the integration and testing of hardware and software platforms in NTMC for all three iTOCs and communication racks installed by the Systems Contractor and keep necessary documentations signed by all parties.
- Review integration of the secure/multi-user Keyboard Video Mouse (KVM) peripheral control of five (5) types of data sources for each iTOC operator and keep all documentation signed by all parties.
- ODOT/City of Norman IT to install required software at the rack PCs and VLANs to enable integration of video display processors with the proposed five Centracs and other servers. Consultant to review and support technical activities, if requested.
- Systems Contractor to deploy as needed local, remote, and mobile based operator interfaces with unified control of multiple applications with drag and drop simplicity and customizable capabilities. Consultant to review and support integration and testing activities as necessary and keep documentation.
- Norman IT to configure, test, and integrate of Layer 2 and Layer 3 switches, VLANs and integration with City servers, however, all parties to support including the Consultant, only if requested. City to involve the Centracs® software platform vendor as necessary and Consultant to provide technical support for the overall integration.

- Consultant to review electrical voltage drops, wire sizes, circuit breakers, and power distribution system test results for Uninterruptible Power Service (UPS) battery back-ups at each iTOC as well as the Communication racks and review the electrical testing of the redundant power supply with HR/IT building power and the backup generator.
- City of Norman IT to coordinate with existing Centracrs® vendor will lead the Centracrs Central platform module integration for control of signals, timings, signal coordination, special timing plan activation, and operation of ITS devices through centralized map icons. Consultant to oversee the Centracrs integration plan and support as requested.
- City and Centracrs® vendor to install and integrate new Centracrs® modules such as CCTV advanced module in addition to the existing Genetec® CCTV platform with help from Norman IT. The Consultant shall support as needed and requested.
- Norman IT will assign server space for any data archive/storage system needs. Consultant to support as needed to oversee the data archival and retrieval process through Centracrs or other system recommended by the City.
- End-to-End Testing – Consultant to attend in person and support the final end-to-end testing led by the Systems Contractor/vendor team, Norman IT, Norman TCD and ODOT/FHWA. Consultant to review test procedures provided by the System Contractor team and other parties, however, the Consultant to develop the RTVM system engineering document. After successful end to end test, conditional system acceptance will be granted, and the 30-day operational tests will commence.
- Final System Acceptance Testing (SAT): At the end of the successful 30-day test, the Consultant will attend and support the SAT test in person to be performed by the Systems Contractor per the EOR specifications. All signoffs on the final SAT will be documented.

1.4.1 Requirements Traceability Verification Matrix (RTVM) Development

Consultant shall develop and maintain a detailed RTVM covering the NTMC/iTOC integration. The following are the steps are to be undertaken:

- a. Develop all key system requirements for the major NTMC elements and how each system requirement will be verified (i.e., through specifications, inspection, and/or testing)
- b. Conduct an internal in-person workshop to finalize the systems requirements and test cases.
- c. Develop verification test cases/test plan for requirements to be verified through testing.

- d. Develop Go Live and final acceptance criteria such that the operation of City's signal platform using Centracs® is fully enabled in all three iTOCs with connectivity with the City's five servers/sources integrated in fulfillment of the key operational objectives.

1.6 RECORD DRAWING DEVELOPMENT

Consultant to submit (draft and final) sets of the NTMC System Contract Record Drawings in 11" X 17" size in an electronic format after NTMC system final acceptance. Contents of the Record Drawings will include the same design sheets prepared by the Consultant covering the work performed with changes marked. Systems Contractor or Building Contractor to provide all field changes and measurements i.e., "as-builts."

1.7 TRAINING SUPPORT AND SOP DEVELOPMENT

Consultant to assist in various training activities as listed in the project specifications with key responsibilities such as scheduling training sessions with the Systems Contractor, maintaining attendance register, and assisting/reviewing the user's manual/training materials prepared by the Systems Contractor. The Consultant will develop the NTMC Standard Operations Procedures (SOP) and lead one virtual training session to go over the SOP.

The SOP shall be a maximum of 30 pages and contain the following key information:

- Introduction/Mission/Vision
- Functions and Services - system coverage map, traffic management system through iTOC, routine system monitoring, NTMC and other field devices, current and future construction plans, NTMC key components, and interagency coordination
- Daily Operations – policy and procedures, severe weather, media requests, CCTV operation and video clips for distribution, ADMS operation, NTMC maintenance. Security, and visitor tours
- General System Operation -communications network type, NTMC server racks, cyber security, electrical power back-up control of signal system via Centracs and ITS devices
- System Operations Procedure during normal, incident, special events and disaster recovery
- Data protection, archival and sharing
- Performance measures
- Appendix- interagency agreements, contracts, and memorandum of understanding to be provided by the City/ODOT.

1.8 SYSTEMS ENGINEERING VALIDATION

Consultant to complete a report for the fulfilment of the last step in Systems Engineering by capturing before/after data for quantification of NTMC benefits and lessons learned. The system validation exercise

will adhere to the initial plan started in the SEA for the NTMC Design (under TWO 1). The City of Norman to provide all data collection for the before scenario for record keeping prior to new TMC system being operational. The City of Norman to also provide all “After” data within the NTMC operations start up period of 6-months. The City to collect the following before/after data at a minimum:

- Citywide incident detection, verification (through CCTV cameras or other means), and clearance times. Collect incident data for a six-month period immediately before deployment of the NTMC and after.
- Before after NTMC travel times and delays along the selected three key corridors during peak hours.
- Before and after City crash statistics along the same three corridors for the same period as other data.
- University of Oklahoma (OU) Sooners home game day traffic statistics covering the above data.

Consultant will include summary of objectives, User Needs (from ConOps) fulfilled, and lessons learned and provide two submissions, Draft and Final.